WaterSMART: Water and Energy Efficiency Grants for FY2020
Funding Opportunity Announcement No. BOR DO 20 F001
Funding Group 1

City of Leavenworth

Advanced Metering Infrastructure Project

Applicant Information: City of Leavenworth
700 Highway 2/PO Box 287
Leavenworth, WA 98826

Prepared By: City of Leavenworth
Joel Walinski, City Administrator
jwalinski@cityofleavenworth.com
Phone: (509) 548-5275/EXT 124
Fax: (509) 548-6429

Project Manager: Herb Amick
Public Works Director
herba@cityofleavenworth.com
Phone: (509) 548-5275

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Executive Summary

Date: October 1, 2020

Applicant Name: City of Leavenworth

Serving the City of Leavenworth, Urban Growth Area, and the surrounding unincorporated area of Chelan County

County: Chelan County

State: Washington

Project Summary

The City of Leavenworth is focused on successfully completing a city-wide/area-wide advanced metering infrastructure (AMI) project. The project was initiated by the City to address ongoing water loss issues, outdated metering equipment and water conservation. The project will convert 100 percent of the City's potable water connections, or approximately 1,400 meters, to an efficient, 'smart-meter,' AMI system. Funds will be used to purchase new smart meter software and to purchase and install AMI meters and appurtenances. The purpose of the AMI Program is to increase water conservation and water use efficiency by updating outdated and inaccurate service meters and providing real-time water consumption data to the City and its customers. AMI technology will automate meter reading, reducing vehicle emissions and maximizing workforce efficiency and allow the City's Water Division to manage valuable water resources more effectively. AMI will enhance customer service by providing real-time information to customers to monitor water usage, leaks and maximize water use efficiency.

Project Timeline

The Project will be done in a single phase commencing in January of 2020. The project will take approximately 15 months to complete. At this time the City has completed Mi.Net RFv4 Propagation Study and contacted several vendors for meter and equipment availability and pricing.

The project is not located on a Federal facility.

Background Data

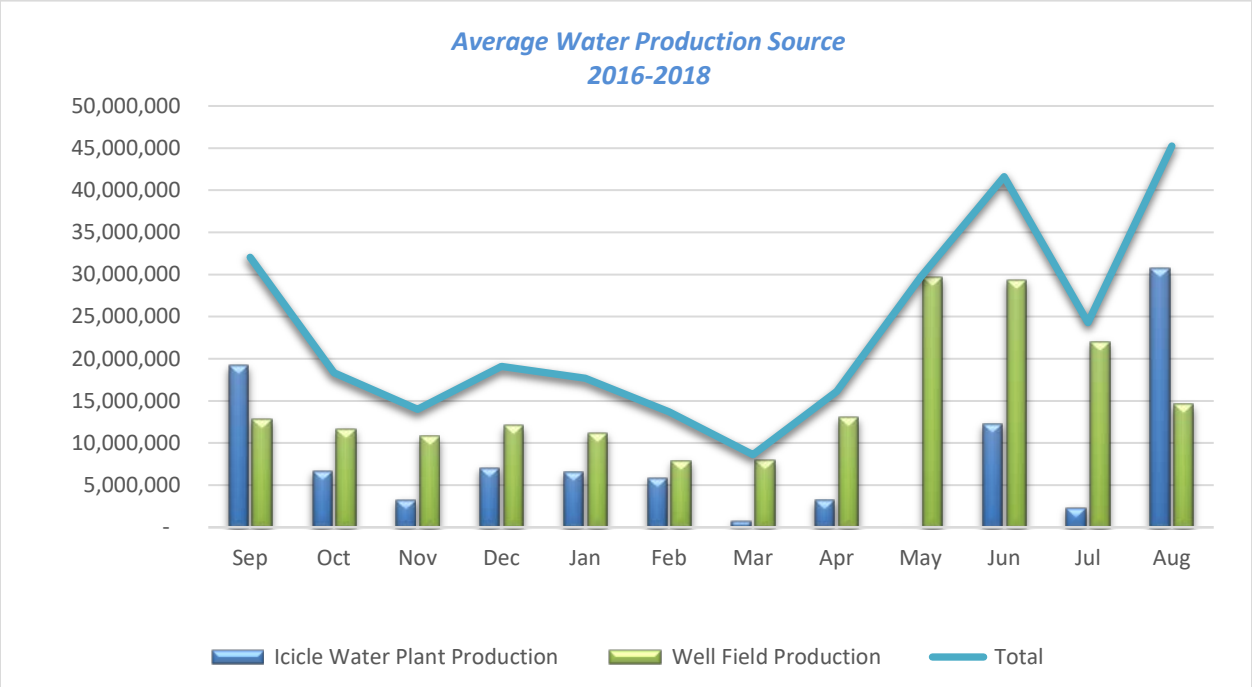
The City of Leavenworth is located along State Highway 2 in the Wenatchee River valley near the confluence with Icicle Creek. High mountains rise above the valley floor on all sides of the City. Variations in elevation necessitate the use of two pressure zones to provide water service.

Existing Facilities

The City has water customers both inside and outside the City Limits. The water system utilizes two pressure zones designated Zone 1 and Zone 2. The surface Water Treatment Plant (WTP) and wells supply Zone 1 and the Icicle reservoir provides storage for Zone 1. The intake for the WTP is on Icicle Creek and the wells are adjacent to the Wenatchee River. The Ski Hill booster station supplies Zone 2 and the Ski Hill reservoir provides storage to Zone 2; the City constructed the Ski Hill booster station and reservoir in 2005.

Sources of Water Supply

The City supplies its water system from both surface water and ground water sources. The water treatment plant withdraws surface water from Icicle Creek and the wells withdraw ground water from an aquifer adjacent to the Wenatchee River. Seasonally the Operator adjusts the various sources of supply to match demand conditions.



Surface Water Supply – Icicle Creek Water Treatment Plant (WTP)

The City's historic primary water supply is the Icicle Creek water intake and filter plant, located about 4½ miles southwest of the City and at river mile 5.7 on Icicle Creek. The filter plant was constructed in 1969 and is an Infilco direct filtration dual media plant, with a pretreatment reaction tank, four sand-anthracite filter beds totaling 476 SF filter area, 133,000 gallon chlorine contact basin, and two vertical turbine finished water pumps. The plant was originally designed for a maximum MGD (about 6 gpm/sf including backwash loss at 5%). The intake pipe limits practical plant capacity to approximately 2.3 MGD; the flocculation chamber has a cold water capacity of approximately 2.0 MGD and a warm water capacity of at least 2.3 MGD. The plant finished water clearwell and contact basin hydraulic grade line (HGL) are approximately at elevation 1,367, which is roughly 26 feet higher than the Icicle reservoir overflow elevation (1,341); this allows gravity supply from the filter plant at about 2.0 MGD (1,390 gpm). Prior to the installation of the chlorine contact basin, the WTP utilized finished water pumps when necessitated by demand. The pumps are 20 HP and 125 HP, and are manually controlled. The larger pump has a maximum rated capacity of approximately 4 MGD (2,800 gpm) and the smaller pump (which is also used for pumping backwash supply) has a capacity of approximately 1.9 MGD (1,350 gpm). However, after installing the chlorine contact basin between the pumps and the transmission main, the WTP lost the ability to pump directly to the transmission main using the finished water pumps (i.e. the pumps can no longer be used for their original purpose of increasing the flow rate out of the WTP).

Icicle Creek water quality varies widely depending upon the season. Water turbidity increases during spring snowmelt and periodically during heavy rainfalls in the summer. In general, turbidity remains low during autumn, winter and most of summer. The water is usually very cold, and has low alkalinity. In the past, these raw water characteristics have made the Icicle Creek supply difficult to treat; however, modern water chemistry has made these variations in raw water quality largely innocuous to the WTP's ability to meet treatment requirements.

Ground Water Supply – Wenatchee River Well Field

In 1989 the City constructed two wells in the vicinity of the City's old collector well. In 2014 the City constructed Well #3 in the same area. These three wells comprise the City's Wenatchee River Well Field. The table following summarizes details on the City's wells:

Table 1-1 Description of Wells

Description [1]	Well #1	Well #2	Well #3
Total Well Depth	106 ft.	94 ft.	115 ft.
Casing Diameter	12"	16"	12"
Screen Diameter	12"	16"	12"
Pump Type	Lineshaft	Submersible	Submersible
Pump Motor Horsepower	125 HP	75 HP	150 HP
Pump Speed (nominal)	1800 RPM	3600 RPM	3600 RPM
Pump Capacity (approximate)	1,200 gpm	750 gpm	1,300 gpm

[1] *Note that the original well logs for Well #1 and Well #2 incorrectly state the legal description. The well log for Well #3 states the correct legal description. The correct legal description for all three wells is SW¼ SE¼ NE¼ of Section 14, T 24N, R17E.*

The water surface level in the Icicle reservoir controls operation of the well pumps. The operator can manipulate lead/lag well pump and on/off levels via the SCADA system. The City has equipped Well #1 with a soft start and Well #2 has variable speed capability. The City conditions power coming into the pump station to ensure compatibility with the soft start and VFD.

The well pump station includes a chlorination room; the chlorine gas injection system provides continuous chlorination when the well pumps operate. A variable speed chlorine gas injection pump matches dosing with flow rate from either or both wells. A 24" ductile iron transmission main connects the wells to the distribution system; this large diameter transmission main provides approximately 10 minutes of chlorine contact time when Wells 1 and 2 operate from point of injection to the first customer service. Were all three well pumps to run concurrently, contact time would reduce to 7 minutes.

The water distribution system within the City consists of mains ranging in diameter from 4" to 12". Pipe materials include steel, cast iron, ductile iron, and PVC. Steel mains generally are dipped and wrapped with O-ring type joints while the cast and ductile iron mains have push-on rubber gasket type joints. The Icicle Valley south of the City has minimal water distribution facilities; pipes in this area consist mostly of privately-owned small diameter service lines connected to the transmission/distribution mains on Icicle Rd and E Leavenworth Rd.

Service Area

The City's existing water service area includes homes and businesses both inside and outside the City limits.

The Washington State Office of Financial Management (OFM) estimates the current population within the City Limits at 1,990. Chelan County Resolution 2015-112 provides population allocations for Chelan County and each of the designated Urban Growth Areas (UGA) including the incorporated City of Leavenworth. This document allocates 2,419 persons in the Leavenworth UGA. This includes the estimated 1,990 persons residing in the City Limits. The following table summarizes estimated total water service area population.

Table 2-2 Current Estimated Population

Designated Area	Population
Leavenworth (City Limits)	1,990
Leavenworth UGA (Outside City Limits)	429 (1)
Total Water Service Area Population	2,559

(1) *Population figures obtained from City of Leavenworth 2017 Wastewater General Sewer Plan and Facility Plan.*

Customer Water Use and Seasonal Consumption Patterns

The City meters all connections to the water system. Each customer receives a monthly bill that reflects the customer's consumption during the billing period. The City upgraded its water billing system in 2007; the first full year recorded in the new billing system was 2008. The Table following contains the City's 2008 and 2009 water use organized by customer class as reported in the City's 2009 Water System Plan.

Table 2-4 Historical Water Use by Customer Class (2008-2009)

Customer Class	2008		2009		Average	
	(MG)	(percent)	(MG)	(percent)	(MG)	(percent)
Residential	87	25%	119	36%	103	31%
Commercial	245	72%	200	61%	223	66%
Unaccounted	10	3%	12	4%	11	3%
Total Produced	342	100%	331	100%	337	100%

Table 2-5 contains the City's current water use organized by customer class, 2014-2016.

Table 2-5 Current Water Use by Customer Class

Customer Class	2014		2015		2016		Average	
	(MG)	(percent)	(MG)	(percent)	(MG)	(percent)	(MG)	(percent)
Residential	106.3	28%	109.8	36%	104.8	38%	107.0	33%
Multi-Family	19.0	5%	18.3	6%	19.3	7%	18.9	6%
Commercial	113.9	30%	115.9	38%	110.4	40%	113.4	36%
Unaccounted	140.5	37%	61.0	20%	41.4	15%	81.0	25%
Total Produced	379.6	100%	305.1	100%	275.9	100%	320.2	100%

The water use data contained in Tables 2-4 and 2-5 indicates that the City's water use patterns have changed over the last decade; in particular, the ratio of residential (including multi-family) to commercial water use has increased from a 31/66 split in 2008-2009 to a 40/36 split in 2014-2016, with a 24% unaccounted for average allocation from 2014-2016.

With the exception of 2014, the City's total water production has not increased over the last ten years, which shows that the City as a whole has not increased water usage. The City's recent unaccounted for portion of water is estimated at an average of 19.4% between 2016-2018; the City does not currently meet the distribution system leakage (DSL) standard of less than 10% set forth in WAC 246-290-820. Decreasing unaccounted for water could allow the City to add connections without increasing total system water production.

The rate of consumption within customer classes changes seasonally throughout the year. The City has two main customer classes: residential and commercial. The City currently reads commercial meters every month and residential meters five months per year (May through September) which provides insight into the summer/winter consumption ratio. The Table following shows the estimated percentage use by each customer class by season.

Table 2-6 Seasonal Consumption Patterns

Season	Residential	Commercial
Summer	75%	65%
Winter	25%	35%
Total	100%	100%

Projected Water Demand

The following Table contains projected water demand for the established planning horizons.

Table 7 Projected Water Demand

Description	Units	Existing (1)	6-year (2)	20-year (2)	50-year (2)
Annual	MG	322	400	498	956
ADD	gpm	613	762	947	1,820
MDD (3)	gpm	1,528	1,899	2,361	4,536
PHD (4)	gpm	2,510	3,120	3,879	7,451
ERUs	ERU	3,096	3,849	4,784	9,191

(1) *Refer to preceding table for source of existing demand figures.*

(2) *Calculated based on an annual growth rate of 2.2%.*

(3) *Existing, 6-year, and 20-year reflect an ADD:MDD peaking factor of 2.5; also see note 3.*

(4) *Existing, 6-year and 20-year PHD calculated using Equation 5-1 from the 2009 DOH WSDM; also see note 3.*

Distribution System Leakage Standard

The Water Use Efficiency Rule within the State of Washington divides system water use into two categories: authorized consumption and distribution system leakage (DSL). Washington State Department of Health (DOH) defines authorized consumption as the volume of water authorized for use by the water system. In addition to normal water sales metering records, systems can track and estimate other types of authorized water uses such as: maintenance flushing of the water system, firefighting and hydrant testing, and cleaning of reservoirs or streets.

DOH considers DSL all water use not authorized by a water system; this includes both apparent losses and real losses such as: leakage, theft, meter inaccuracies, meter reading errors, data collection errors, calculation errors and water main breaks.

The City calculates DSL by comparing source production meters with water sales from customer meters. Table 2-5 on page 5 contains the City's current calculated DSL. The City's unaccounted for portion of water is estimated at an average of 19.4% annually between 2016-2018 and the City does not currently meet the distribution system leakage (DSL) standard of less than 10% set forth in WAC 246-290-820.

The City of Leavenworth believes the 2016-2018 average DSL of 19.4% is primarily due to inaccurate and the failing service metering system that needs replacement citywide. Once new meters are installed annual comparison of water sold versus water produced will show the effect the new service metering system has on DSL.

Water Loss Control Action Plan (WLCAP)

DOH has defined three categories of water loss control action plans:

For water systems greater than 10 and less than 20 percent DSL, systems must:

1. Assess data accuracy.
2. Assess data collection methods and errors.

For water systems between 20-29 percent DSL, within 12 months systems must:

3. Complete 1 and 2 above.
4. Implement field activities to reduce leakage.

For water systems with 30 percent or greater DSL, within 6 months systems must:

5. Complete steps 1, 2, and 4 above.
6. Implement additional water loss control methods to reduce leakage.

Leavenworth's current 19.4% level of DSL requires a water loss control action plan to address items 1 & 2 in the preceding list. The City's control methods currently implemented includes examined data accuracy and data collection methods for possible errors or inaccuracies. It appears possible that a portion of the calculated DSL is due in part to service meters under reading the amount of water used. The City is currently working to implement a citywide replacement program of all service meters. Leavenworth believes replacement of these meters may be substantial enough to decrease DSL significantly in future years.

Leavenworth expects DSL to reduce within or near the 10% range once service meters are replaced. The City's ability to secure funding for service meter replacement affect the City's ability to move forward with the WLCAP and comply with the standard. WLCAP related costs (other than additional funding needed for new meters) are included in the City's budget expenses shown in the table below. The City plans to fund sixty percent (60%) of the meter replacement costs through reserves and thirty percent (30%) is being sought through funding sources (Bureau of Reclamation WaterSMART program). Total service meter replacement will consist of approximately 1,400 new meters. Once a full financial plan and funding is secured, the City estimates all meters will be replaced in approximately one year.

The Water System 10 Year Budget Projection is provided in the following table. The City completed a Utility Rate Study in 2017 and funding for the meter project was included for future capital costs and water rates will account for 65% of the project costs.

Water System 10-Year Budget Projection

Category/Description	2018 [2]	2019	2020	2021	2022	2023	2024	2025	2026	2027
Expenditures [1]										
Legal Services / Pro Svs [3]	$38,239	$39,386	$40,567	$41,785	$43,038	$44,329	$45,659	$47,029	$48,440	$49,893
Salaries, Wages, Benefits and Overtime [3]	402,490	414,565	427,002	439,812	453,006	466,596	480,594	495,012	509,862	525,158
Total Supplies (Distribution System & WTP) [3]	42,230	43,497	44,802	46,146	47,530	48,596	50,425	51,938	53,496	55,101
Total Other Services and Charges [3]	137,098	141,211	145,447	149,811	154,305	158,934	163,702	168,613	173,672	178,882
WTP NPDES, Testing, WUE meas., WLCAP [3]	14,420	14,853	15,298	15,757	16,230	16,717	17,218	17,735	18,267	18,815
Taxes [3]	205,817	211,991	218,351	224,901	231,648	238,598	245,756	253,129	260,722	268,544
Interfund Rentals and Leases [3]	72,850	75,035	77,286	79,605	81,993	84,453	86,987	89,596	92,284	95,053
Debt Repayment [4]	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000
Misc. System Expenses/Improvements [4]	100,000	100,000	see below	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Capital Improvements	-	-	450,000 [5]	-	-	-	-	-	-	-
Total	$1,353,143	$1,380,538	$1,758,754	$1,437,816	$1,467,751	$1,498,583	$1,530,341	$1,563,051	$1,596,743	$1,631,445
Revenue [1]										
Net Cash Invest	$221,446	$351,120	$481,196	$261,408	$391,477	$521,109	$649,996	$777,815	$904,227	$1,028,887
Rates [6]	1,389,817	1,417,614	1,445,966	1,474,885	1,504,383	1,534,471	1,565,160	1,596,463	1,628,393	1,660,960
Taps [4]	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Fines & Penalties [4]	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500
Misc. Revenues / Refunds	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Investment Interest [4]	500	500	500	500	500	500	500	500	500	500
Total	$1,704,263	$1,861,734	$2,020,162	$1,829,293	$1,988,860	$2,148,579	$2,308,156	$2,467,278	$2,625,619	$2,782,837
Balance – Water System Capital Reserve	$351,120	$481,196	$261,408	$391,477	$521,109	$649,996	$777,815	$904,227	$1,028,877	$1,151,392

Expenditures [1]
Revenue [1]

(1) *Figures rounded to the nearest whole dollar.*
(2) *Based on 2017 budget (refer to **Table 7-1**) and adjusted as indicated by other footnotes.*
(3) *Based on 3% annual inflation.*
(4) *Assumed to remain constant over the planning period.*
(5) *Planned citywide water service meter replacement Capital Improvement project. Actual timeline of project dependent on when and if additional funding can be obtained.*
(6) *Assumes an average annual rate increase of 2%. Actual annual rate increases may vary.*

Project Location

Location

The City of Leavenworth is located on the eastern side of the Cascade Mountains approximately 120 miles east of Seattle Washington in Chelan County. The City is located along State Highway 2 in the Wenatchee River valley near the confluence with Icicle Creek. High mountains rise above the valley floor on all sides of the City. Substantial variations in elevation necessitate the use of multiple pressure zones to provide water service. The City has a total area of 1.39 square miles (3.60 km2), of which, 1.37 square miles (3.55 km2) is land and 0.02 square miles (0.05 km2) is water

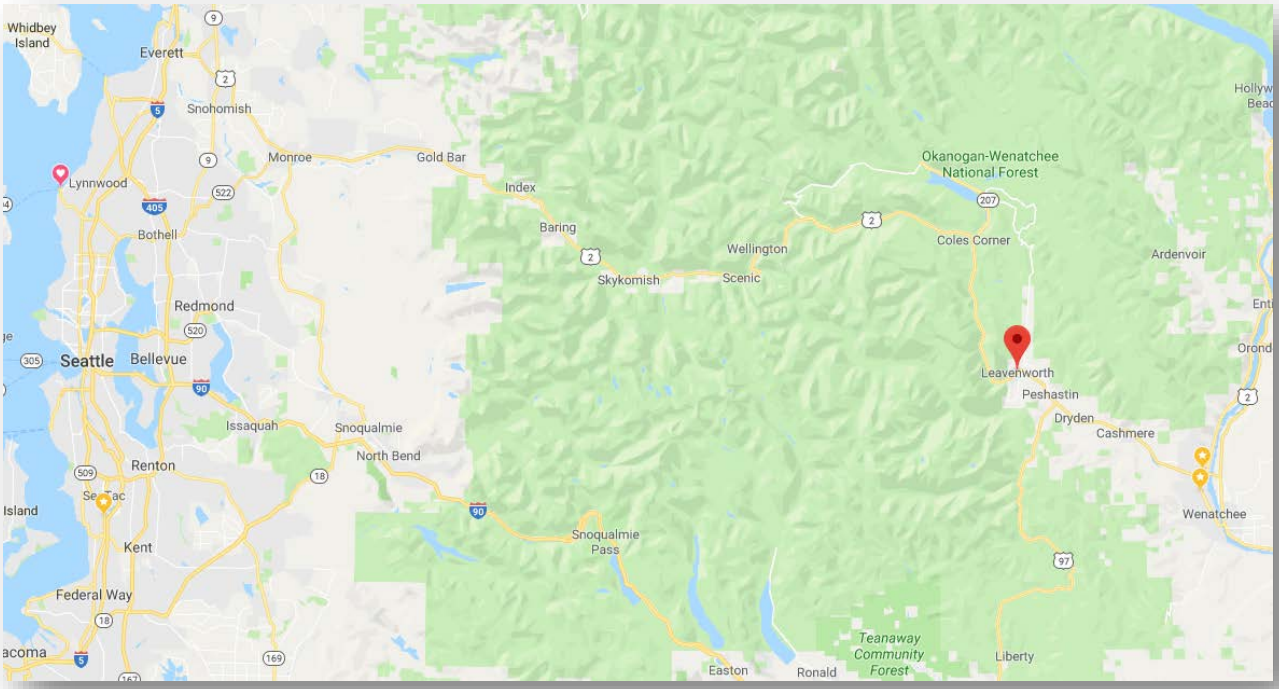
Tourism is a substantial component of the local economy in Leavenworth. Sources estimate that up to 2,000,000 people visit Leavenworth annually and that some festival weekends attract as many as 60,000 tourists. As a result, water use by businesses can vary substantially with tourism peaks. These large variations in water use necessitate vigilant observation of water demand conditions by water treatment plant operators.

Summer weather is typically anticyclonic due to the presence of the North Pacific anticyclone, with resultant clear skies and large diurnal temperature ranges. Rainfall is limited by the Cascade rain shadow as well as by the anticyclone, and all months from May to October have recorded zero precipitation on occasions. The annual average snow fall amount is 92 inches.

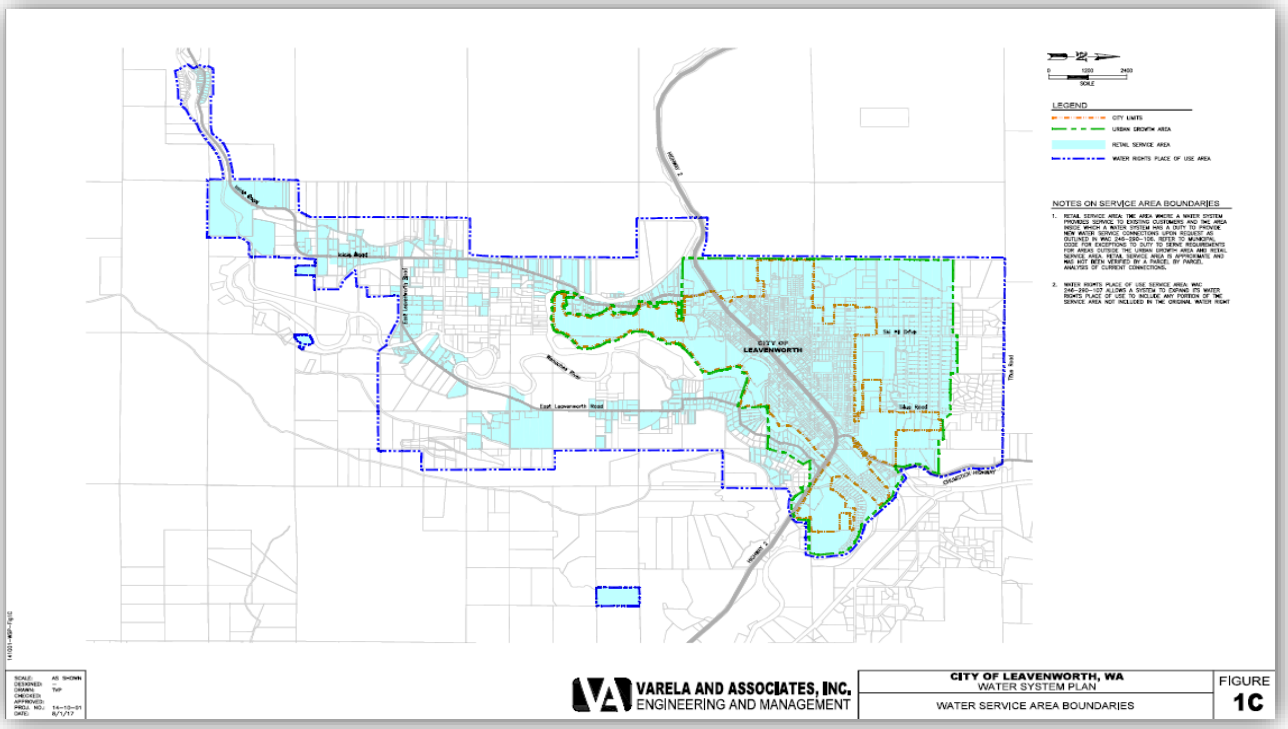
Degrees Minutes Seconds:
Latitude: 47-35'46'' N
Longitude: 120-39'41'' W

Decimal Degrees:
Latitude: 47.5962326
Longitude: -120.6614765

Leavenworth WA, Chelan County



City of Leavenworth, Water Service Area



Technical Project Description

The City of Leavenworth proposes to install an Automated Metering Infrastructure (AMI) system. The system will consist of approximately 1,400 new state-of-the-art water service meters to replace older under-reading meters equipped to wirelessly transmit water-usage data to a reception tower. Also included in the AMI project are data collection stations, radio transmitters, meter data analysis and billing software, appurtenances, system start-up and training.

The purpose of the AMI project is to replace old, inaccurate water meters and better track water system demand in real time, to reduce unaccounted for water, use water more efficiently and measure effects of conservation measures. By tracking real time data of water system demands, Leavenworth will be able to educate customers regarding water use and also identify leaks and other areas where additional conservation may be possible.

The AMI project will allow Leavenworth the ability to perform the following:

- Installing new service meters will allow the City to better track and quantify unaccounted for water and better identify where distribution system losses and unaccounted for water are originating.
- Installing new meters will provide the City with the ability to accurately read the lowest usage flows, ensuring customers are accurately billed for all the water they use.
- The system has the ability to enable customers to access their accounts online to view their own water consumption.
- Additional demand data will enable Leavenworth to optimize operational and energy efficiency of its well pump stations, water reservoirs and water treatment plant water and help identify capital improvements
- Alerts triggered by unusual or continuous usage patterns which can be indicative of leaks before there is extensive water loss or property damage.
- Optimize water rates based on actual water use and to justify changes in rates for high users which can allow for equitable use on the system.
- Eliminate vehicle miles and staff time for manually reading each service meter individually.

Leavenworth City staff will provide administrative oversight for the project. Activities will include reviewing and executing the grant agreement and contract, attending (and preparing for) requested meetings with the Bureau of Reclamation (BOR), maintaining grant and project files, preparing and processing requests for reimbursements, preparing updates for the City Council, ensuring grant agreement compliance, completing and submitting quarterly and final reports as outlined in the grant agreement, coordinating any audit request and/or examination of records by BOR or independent auditors, and maintaining all records after the project is closed out.

The AMI project will include the following tasks and generally proceed as follows:

- Fulfill environmental and cultural resource requirements
- Finalize system design and cost with chosen contractor and AMI manufacturer
- Notify customers of the system upgrade and provide education regarding the logistics and benefits of the new system
- AMI equipment installation
- System start-up, commissioning and City staff training

The proposed project will begin in 2020, following BOR notification of funding, and will be completed by 2021 (estimated 15-month timeframe). Upon execution of the grant award with the BOR, a contract will be awarded to the selected contractor who will manage all aspects of the project (including purchase, installation, integration, and testing of the AMI) with oversight from the City of Leavenworth.

Additional detailed scope of work and task descriptions are included in the Project Budget section of this application.

Project Timeline

The AMI Project will take less than 12 months for the installation of all meters within the City of Leavenworth Service Area with an anticipated substantial completion date of October 30, 2020 and a fully closed project by March 30, 2021.

Pre-construction activities include, but are not limited to, the preparations of cost estimates and specifications for contract advertisement, review of estimates of probable costs by equipment providers, propagation studies, and customer outreach. Propagations studies performed prior to the start of construction will determine the strategic placement of data collectors and installation to maximize effectiveness. The City intends to install all equipment and data collectors on City owned facilities and Right of Way. Propagation studies to date have indicated this is work is possible to be completed on municipal property or right of way.

The construction phase of the Project entails the installation of the Base Stations and Booster Stations as determined by the propagation study. Upon installation of the data collectors the awarded vendor will proceed with the change out of change out of the residential and commercial meters within the Service Area. The vendor will work with the City's Public Works Department and Finance Department to develop and test software platform interface and train utility end users prior to activation. The City will initiate a public outreach and education effort to notify water system users of the new customer portal software, featuring tools to help customers better manage their own water usage.

Evaluation Criteria

E.1.1. Evaluation Criterion A-Quantifiable Water Savings (30 points)

Up to 30 points may be awarded for this criterion. This criterion prioritizes projects that will conserve water and improve water use efficiency by modernizing existing infrastructure. Points will be allocated based on the quantifiable water savings expected as a result of the project. Points will be allocated to give greater consideration to projects that are expected to result in more significant water savings.

Municipal Metering

The existing distribution system losses (DSL) are approximately 19 percent for 2016 through 2018. The table below shows Leavenworth's total production for the same period. Leavenworth had seen a decrease in DSL from 25 percent to the current level due to more accurate record keeping and metering on surface water and groundwater sources. The goal is a DSL of 10 percent per the regulator standard. It is anticipated that Leavenworth may approach this goal through more accurate distribution and residential metering. As seen in the table below through more accurate metering Leavenworth will be able to identify real system losses (leakage, theft, etc.) leading to conservation savings. The actual water savings are presumed to occur at 50 percent of the apparent water savings. This is a conservative estimate compared to the 75 percent recoverable estimated by Thornton, J., R. Strum, and G. Kunkel, Water Loss Control Manual (2nd Ed), McGraw-Hill, 2008.

Potential Water Savings

Water Year	Total Water Use (acre-ft)	Apparent Water Saving (acre-feet)	Actual Water Saving (acre-feet)
2016	1061	100	50
2017	919	86	43
2018	861	81	40

Leavenworth estimates implementation of its radio-read water meter project will reduce the apparent annual water use by 22 acre-feet per year. The following sections provide the basis for the City's estimate of quantifiable water savings:

Describe current losses: Please explain where the water that will be conserved is currently going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground)?

A portion of the high percentage of the water that is identified as a Distribution System Loss (DSL) is currently being used by users of the water system. It is assumed that the apparent water loss is as much as 50 percent, however it is unaccounted for.

Describe the support/documentation of estimated water savings: *Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations. Note: projects that do not provide sufficient supporting detail/calculations may not receive credit under this section. Please be sure to consider the questions associated with your project type (listed below) when determining the estimated water savings, along with the necessary support needed for a full review of your proposal.*

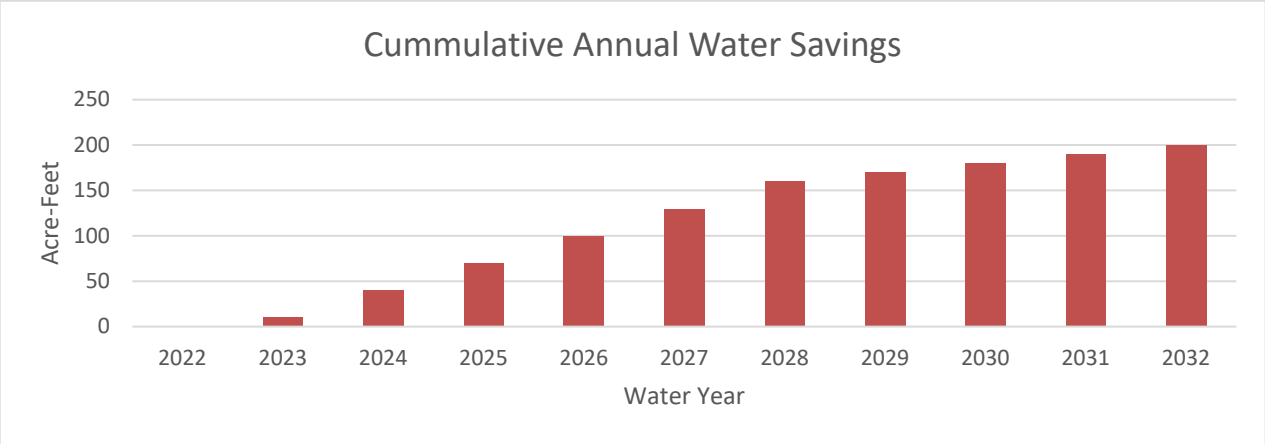
In addition, please note that the use of visual observations alone to calculate water savings, without additional documentation/data, are not sufficient to receive credit under this section.

Further, the water savings must be the result of reducing or eliminating a current, ongoing loss, not the result of an expected future loss.

The Icicle Working Group's selected preferred alternative from the Icicle Strategy Programmatic Environmental Impact Statement (PEIS) estimates total conservation savings of 400 acre-feet from metering, pipe replace, and rural conservation. Leavenworth's total conservation saving estimate is a performance based, 0.5 cubic feet per second, and was developed in conjunction with the total contribution from basin stakeholders (Leavenworth National Fish Hatchery, Icicle-Peshastin Irrigation District, Cascade Orchard Irrigation Company, and Chelan County). The PEIS presumes total conservation from metering and pipe replacement is approximately 50 percent of the total savings (200 acre-feet) and anticipates implementation of the selected alternative in less than 10 years.

It is expected that following implementation of Leavenworth's water meter project Leavenworth will direct efforts toward pipe replacement and community conservation projects within the 10-year timeframe, resulting in an average conservation savings of 20 acre-feet per year.

Leavenworth plans to evaluate the rate structure in 2022 after new metering data becomes available—the PEIS conservation savings estimate does not include savings as a result of behavioral changes due to water price changes. However, the figure below demonstrates the expected conservation savings following installation of new metering system. It is expected that immediate water conservation is likely to proceed with capital projects to fix leaky pipes and detect theft (10 percent actual water savings each year for 5 years) and followed by implementation of conservation measures such as a conservation rate structure (5 percent actual water savings each year).



1. *How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.*

The existing distribution system losses (DSL) are approximately 19 percent for 2016 through 2018. The table below shows Leavenworth's total production for the same period. Leavenworth had seen a decrease in DSL from 25 percent to the current level due to more accurate record keeping and metering on surface water and groundwater sources. As seen in the table below through more accurate metering Leavenworth will be able to identify real system losses (leakage, theft, etc.) leading to conservation savings. The actual water savings are presumed to occur at 50 percent of the apparent water savings. This is a conservative estimate compared to the 75 percent recoverable estimated by Thornton, J., R. Strum, and G. Kunkel, Water Loss Control Manual (2nd Ed), McGraw-Hill, 2008.

Potential Water Savings

Water Year	Total Water Use (acre-ft)	Apparent Water Saving (acre-feet)	Actual Water Saving (acre-feet)
2016	1061	100	50
2017	919	86	43
2018	861	81	40

Leavenworth estimates implementation of its radio-read water meter project will reduce the apparent annual water use by 22 acre-feet per year. The following sections provide the basis for the City's estimate of quantifiable water savings:

- Based on meter readings from Leavenworth's existing service meters, the average single-family residence (equivalent residential unit – ERU) used 269 gallons per day for the period 2014-2016.
- As water meters age, they lose accuracy and register less water than actually passes through the meter. The following references estimate the percentage of flow likely missed by a water meter based on the water meter's age:
    - Michael D. Yee. "Economic Analysis for Replacing Residential Meters." Journal AWWA Volume 91, Issue 7, 1999, Pages 72-77.
    - Dr. Hans D. Allender, PE. "Determining the Economical Optimum Life of Residential Water Meters." WATER/Engineering & Management September 1996, Pages 20-23.
    - Scott Morris. "AMI Boosts Meter-Reading Accuracy and Revenue." Opflow AWWA March 2013, Pages 18-19
- Based on the preceding references and case studies, water meters experience a significant drop in accuracy between 25 and 30 years of age when meters can drop from 95% accurate to 80% accurate.

- Leavenworth estimates that 65% of its single-family meters and 22% of its multifamily meters are 30 years of age or older.
- The following calculations estimate the volume of water passing through 30-year or older meters that is not being registered on the meters [estimates are calculated in million gallons (MG) and converted to acre-feet (ac-ft)]:
    - 2014-2016 annual residential volume sold: 104 MG (319 ac-ft)
    - Estimated volume missed by 30-year old meters: (104 MG) x (65%) x (20%) = 13.5 MG (41.4 ac-ft)
    - 2014-2016 annual multi-family residential volume sold: 18.3 MG (56.2 ac-ft)
    - Estimated volume missed by 30-year old meters: (18.3 MG) x (22%) x (20%) = 0.8 MG (2.5 ac-ft)
    - Total annual volume estimated lost to inaccurate meters: 13.5 MG + 0.8 MG = 14.3 MG (43.9 ac-ft)

2. *How have current distribution system losses and/or the potential for reductions in water use by individual users been determined?*

The City meters its water source production meter (replace and updated in 2012) and it meters its service connections water sales. These totals are compared on an annual basis and the difference calculated. The Washington State Department of Health (DOH) requires systems to report their annual distribution system losses and develop a water loss control action plan if losses exceed 10%. In 2019 Leavenworth calculated its average 3-year distribution system losses at 19.4 (36.9 MG or 82.6 ac-ft). If the preceding assumptions regarding the volume of water currently missed by 30-year old meters are accurate, implementing the AMI meter project should reduce the City's annual distribution system losses to approximately 8.8% (22.6 MG or 69.4 ac- ft).

3. *For installing individual water user meters, refer to studies in the region or in the applicant's service area that are relevant to water use patterns and the potential for reducing such use. In the absence of such studies, please explain in detail how expected water use reductions have been estimated and the basis for the estimations.*

The preceding estimates are based on studies from the American Water Works Association (AWWA) and other water industry publications (refer to preceding specific references). The water use savings are predicated on the assumption that the existing meters 30-years and older have declined in accuracy and do not register all the water delivered to customers through these meters. The preceding calculations further assume that when new meters are installed and customers are billed for their full water use, customers will respond to a higher water bill by conserving and using less water.

4. *If installing distribution main meters will result in conserved water, please provide support for this determination (including, but not limited to leakage studies, previous leakage reduction projects, etc.). Please provide details underlying any assumptions being made in support of water savings estimates (e.g., how leakage will be reduced once identified with improved meter data).*

As stated in preceding discussions, the City estimates a portion of water delivered to customers through 30-year old meters is not being registered by the old meters. The City expects this project to allow the City to recover the volume of water currently going un-billed. When customers receive bills for their full use the City expects its customers to respond by conserving water due to higher water bills. This project will also put additional tools at the City's disposal to identify customer leaks, tailor its water rate structure to improve water use efficiency, and provide more frequent feedback to its customers regarding their water use and the corresponding impact to water bills when they waste it or conserve it.

5. *What types (manufacturer and model) of devices will be installed and what quantity of each?*

The City plans to install a complete AMI system including meters, data collection stations, radio transmitters, meter data analysis and billing hardware and software. The majority of the equipment and devices to be installed will be Sensus brand units. The following provides an overview of the proposed equipment (a detailed breakout of the budget proposal is included in the Attachments):

- Programming Equipment
    - FL6502-GB with docking station
    - Command Link
- Base Stations
    - M400B
- Booster Station (for radio equipment)
    - M400B
- Software
    - RNI SaaS + Sensus Analytics Enhanced
- Water Meters (Sensus brand)
    - 1,095 Iperl TRPL 1000G ¾" water meters
    - 133 Iperl TRPL 1000G 1" water meters
    - 38 Omni C2 1.5" water meters
    - 39 Omni T2 1.5" water meters
    - 13 Omni C2 2" water meters
    - 51 Omni T2 2" water meters
    - 12 Omni T2 3" water meters
    - 1,381 520M SmartPoint communication modules

6. *How will actual water savings be verified upon completion of the project?*

Leavenworth's primary performance measure for this project is to be a reduction in the difference between volume produced at system sources and the volume measured thorough service connections; this volume difference is generally referred to as distribution system leakage (although things other than leaks contribute to this volume such as inaccurate service meters). The City's 2019 3-year average leakage percentage was 19.4%. The City plans to install the meters in 2020. The first full year of data for the new meters will be 2021. The City will compare pre and post project years to document actual water savings. The detailed methodology for verifying actual water savings is outlined in the Performance Measures section of this application. Based on the preceding estimate of water to be saved, Leavenworth estimates the years following completion, unaccounted for losses will be reduced to approximately 10 percent. Therefore, the performance measure will be to document the water savings of reducing unaccounted for water from 19 to 10 percent following project completion.

E.1.2. Evaluation Criterion B-Water Supply Reliability (18 points)

Up to 18 points may be awarded under this criterion. This criterion prioritizes projects that address water reliability concerns, including making water available for multiple beneficial uses and resolving water related conflicts in the region.

1. *Will the project address a specific water reliability concern? Please address the following:*

   Explain and provide detail of the specific issue(s) in the area that is impacting water reliability, such as shortages due to drought, increased demand, or reduced deliveries. Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)?

There are multiple competing demands for water in the Icicle Creek Watershed and the Wenatchee River. These include out-of-stream water supply needed for irrigation, operation of the Leavenworth National Fish Hatchery (LNFH), and domestic use by the City of Leavenworth and rural growth. Instream flows are also needed to support habitat and passage needs for endangered species act (ESA) listed fish species: spring Chinook (endangered), steelhead (threatened), and bull trout (threatened). Tribal fish harvest by the Yakama Nation and Colville Confederated Tribes occur on Icicle Creek near LNFH. During late summer and early fall, when natural flows are lowest, it is a challenge to meet all out-of-stream demands, while meeting instream flow targets for fish. This has been demonstrated by the minimum instream flows established in chapter 173-545 WAC not being met, interruptible water users not receiving water, agricultural water users being rationed during drought, litigation over water rights, while collective urban and rural water rights are not sufficient to support population projections through 2050. The Icicle Work Group was convened in 2012 to find collaborative solutions for water management and has developed a comprehensive strategy that addresses all of the diverse interests and needs. Improving domestic supply to meet current and future needs through at least 2050 is a priority in the Icicle Strategy. This metering project is an important early action project for the Icicle Work Group.

2. *Describe how the project will address the water reliability concern? In your response, please address where the conserved water will go and how it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.*

This project directly addresses some of the domestic water supply goals in the Icicle Strategy as well as meeting objectives in the Water Loss Control Action Plan which was developed for the 2018 Leavenworth Water System Plan. Water conserved from this project will reduce Leavenworth's utilization of the Icicle Creek source thereby leaving more water in Icicle Creek when not in use. This water saved will also extend the use of the City's current rights, thus extending the timed needed to obtain additional water to meet future demand.

3. *Will the project make water available to achieve multiple benefits or to benefit multiple water users?*

Yes. This project is an important part of the Icicle Strategy which collectively addresses many water related issues in the Icicle Watershed including support of commercial agriculture and operating of the Leavenworth National Fish Hatchery (funded by Reclamation). The conservation from this project helps the City meet its current and future demands for water which is important for the community. Limits on future water allocations under the Wenatchee Instream Flow Rule make projects like this essential for the City to meet commercial and industrial needs and enable to community to plan for residential growth.

4. *Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a state listed species, or a species of particular recreational, or economic importance)? Please describe the relationship of the species to the water supply, and whether the species is adversely affected by a Reclamation project.*

Yes. Low stream flows are identified as a priority ecological concern to be addressed in both Icicle Creek and the Wenatchee River by the Upper Columbia Regional Technical Team, a committee of fish biologists tasked with providing expertise in the implementation of the Upper Columbia Salmon Recovery Plan. Increasing instream flows is a significant goal of the Icicle Strategy, which aims to add over 40 cfs to Icicle Creek. Both Icicle Creek and the Wenatchee River have fish species listed for federal protection under ESA. These include spring Chinook salmon (endangered), steelhead trout (threatened), and bull trout (threatened). Other species of interest include summer Chinook salmon, sockeye salmon, Westslope cutthroat trout, and Pacific lamprey. The Leavenworth National Fish Hatchery located on Icicle Creek is one of three fish hatcheries authorized by Congress as mitigation for the construction of Grand Coulee Dam.

5. *Will the project benefit a larger initiative to address water reliability?*

Yes. As mentioned above, this project is one of many projects identified in the Icicle Strategy that collectively will meet many goals. The Icicle Work Group (IWG) is made up of a diverse set of stakeholders including all four major water users within the Icicle Watershed: Icicle Peshastin

Irrigation District, City of Leavenworth, Cascade Orchard Irrigation Company, and Leavenworth National Fish Hatchery. Other IWG members include all local, state and federal agencies, tribes, irrigation and agricultural interests, and environmental organizations. The collective goals of the IWG (called guiding principles) include: improving instream flow, a sustainable LNFH, meeting tribal treaty and federally protected harvest rights, providing water to meet municipal and domestic demand, improve agricultural reliability, improve ecosystem health, protect non-treaty harvest, and comply with all state and federal laws and wilderness acts.

6. *Will the project benefit Indian tribes?*

Yes. Improvements to Icicle Creek also improve conditions for hatchery produced spring Chinook salmon that support important Tribal harvest rights on Icicle Creek. As a part of the Icicle Strategy, implementation of this metering project will also help garner support for all Icicle Strategy projects including those that protect and improve the tribal fishery on Icicle Creek.

7. *Will the project benefit rural or economically disadvantaged communities?*

Yes. Meeting the rural domestic needs in and around Leavenworth are a part of the Icicle Strategy's goals. Implementing this metering project helps the City of Leavenworth meet its current and future needs as well as helps the City coordinate water needs with Chelan County to meet the exempt well needs in the area.

8. *Describe how the project will help to achieve these multiple benefits. In your response, please address where the conserved water will go and where it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address sh01tages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.*

The Icicle Strategy is a programmatic approach to water resource management meaning that the IWG is committed to implementing a set of projects that meet all of the goals. Specifically, this project helps meet the municipal and domestic water goals. The water conserved will allow the City to add connections without increasing the total water system production. This will extend the City's need to increase its diversions. This project will also help the City manage its diversion based on need, allowing the water not needed to stay instream at times.

9. *Does the project promote and encourage collaboration among parties in a way that helps increase the reliability of the water supply?*

Yes. Finding collaborative solutions for water management within the Icicle Creek watershed to provide a suite of balanced benefits for existing and new domestic and agricultural uses, non-consumptive uses, fish, wildlife, and habitat while protecting treaty and non-treating fishing interests is the vision of the Icicle Work Group. This metering project is on track to be one of the first projects implemented from the Icicle Strategy. This project has full support of the IWG and its implementation will be a catalyst for the larger implementation effort needed for the full Strategy.

The City of Leavenworth has been a member of the Icicle Work Group (IWG) since it began in 2012. The IWG consists of a variety of Icicle Creek stakeholders including local, state and federal agencies, tribes, irrigation districts, and environmental groups. The purpose of the IWG is to develop a comprehensive Icicle Creek Water Resource Management Strategy through a collaborative process that will achieve diverse benefits defined by a set of guiding principles: improved stream flow, a sustainable fish hatchery, ensuring that Tribal Treaty and federally- protected fishing rights are met, provide additional water to meet municipal and domestic demand, improve agricultural reliability, improve ecosystem health, and protect non-treaty harvest all while complying with all state and federal laws and Wilderness Acts. The IWG has made great progress over the last six years defining goals with numeric metrics and has proposed a "base package" of projects and alternatives that will offer lasting solutions in the watershed. Based on this work, Chelan County and the Washington Department of Ecology's Office of Columbia River recently completed a Final Programmatic Environmental Impact Statement (FPEIS) for Icicle Creek. The City of Leavenworth meter project is included in the preferred alternative and is critical to meeting the domestic conservation and efficiencies goals defined.

Included in this application is a letter of support from the Co-Conveners of the Icicle Work Group (IWG), a diverse set of stakeholders working collaboratively on water resource solutions in Icicle Creek. The IWG is committed to implementing the projects necessary to meet all of the guiding principles. Implementing this project will be an early "win" for the IWG and will help leverage funds for the other projects as well as stronger support among Icicle Work Group members.

The collaborative support described above is necessary to continue to support the Icicle Strategy process and ultimately implement the set of projects necessary to meet all of the goals. Given the diverse set of issues and water users, this will only be accomplished through this collaborative process.

10. *Is there widespread support for the project?*

Yes. Chelan County and WA Department of Ecology adopted a Final Programmatic Environmental Impact Statement (PEIS) in January 2019 (https://www.co.chelan.wa.us/natural-resources/pages/environmental-review) for the Icicle Strategy. This PEIS went through a public comment period where conservation projects like this metering project received overwhelming public support. Widespread outreach was conducted on the Icicle Strategy throughout Leavenworth, Chelan County and the Seattle area. The City of Leavenworth City Council has approved Resolution #3-2019 supporting continued support of the Icicle Strategy and advancing the preferred alternative package of projects. Through that process, conservation and efficiency projects like this gained widespread support from public meeting attendees.

11. *What is the significance of the collaboration/support?*

The collaborative nature of the Icicle Strategy is helping move many important projects to implementation. This is helping with funding coordination and sequencing projects in a way that helps all IWG members see their needs are being met. This effort also helps communicate projects like this metering project to the public.

12. *Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?*

Yes. The Icicle Work Group created a Water Conservation Committee to identify water conservation and efficiency projects to be implemented to meet the Icicle Strategy's conservation goals. The City of Leavenworth, Chelan County, Icicle Peshastin Irrigation District and Cascade Orchard Irrigation Company participate on this committee and are committed to working together to implement projects within their water delivery systems and to coordinate on efforts such and lawn reduction programs.

13. *Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?*

Yes. This project will help meet the City's current and future water demands as well as help meet the domestic conservation and efficiency goals of the Icicle Strategy. One impetus to form the IWG was to resolve longstanding water resource conflicts in a collaborative way as an alternative to litigation. Litigation focused on water resource issues at the LNFH and between the City of Leavenworth and WA Department of Ecology on domestic uses. The City and Ecology have litigation on hold while they find a non-litigious solution to water management in Icicle Creek through the Icicle Strategy and in projects like this.

14. *Describe the roles of any partners in the process. Please attach any relevant supporting documents.*

This project is identified in the Icicle Strategy's preferred alternative. All Icicle Work Group members support this project as is reflected in the attached letter of support written on behalf of the IWG by Chelan County and Ecology. The Project is also supported by the Washington State Department of Health (DOH) to improve water conservation and also protecting public health on detecting backflow incidences as identified in the letter of support from DOH.

E. 1.5. Evaluation Criterion E-Department of the Interior Priorities (10 points)

Up to 10 points may be awarded based on the extent that the proposal demonstrates that the project supports the Department priorities. Please address those priorities that are applicable to your project. It is not necessary to address priorities that are not applicable to your project. A project will not necessarily receive more points simply because multiple priorities are addressed. Points will be allocated based on the degree to which the project supports one or more of the priorities used, and whether the connection to the priority(ies) is well supported in the proposal.

Through the Icicle Work Group communication on water management issues in the Icicle Watershed has been expanded significantly. IWG members include irrigation districts, local agricultural representatives, Washington State Department of Ecology, Washington State Department of Fish and Wildlife, US Fish and Wildlife, US Bureau of Reclamation, NOAA Fisheries, US Forest Service, Chelan County, Yakama Nation, Colville Confederated Tribes, City of Leavenworth, and environmental organizations. This diverse group meets monthly to discuss the goals established in the Strategy and the projects that will achieve these goals, including this

metering project. This group works collaboratively to address these important issues and communicate its efforts to the public.

This project will update the City's water connection infrastructure with the newest technology in advanced metering. Updating this infrastructure will increase the City's water conservation and water use efficiency and will provide real-time data to the City and its customers.

E.1.6. Evaluation Criterion F- implementation and Results (6 points)

Up to 6 points may be awarded for these subcriteria.

E.1.6.1. Subcriterion F.1- Project Planning

Points may be awarded for proposals with planning efforts that provide support for the proposed project.

Provide the following information regarding project planning:

1. *Identify any district-wide, or system-wide, planning that provides suppo1i for the proposed project. This could include a Water Conservation Plan, SOR, Drought Contingency Plan or other planning eff01is done to determine the priority of this project in relation to other potential projects.*

2. *Describe how the project conforms to and meets the goals of any applicable planning efforts and identify any aspect of the project that implements a feature of an existing water plan(s).*

The Washington State Department of Health (DOH) requires water purveyors complete a Water System Plan (WSP) every six years and a Water Use Efficiency (WUE) Plan annually. The City's most recent WSP was adopted in 2018 and is on file at City Hall. Among other things, the purpose of the WSP is to make the best use of available resources by providing a comprehensive evaluation of existing and future system needs, minimize public health risks, protect sources of supply and make efficient use of those sources of supply. Leavenworth uses its WSP as a tool to help plan for infrastructure needs and improvements and long- term water supply needs.

The City's Water Use Efficiency Plan (contained within the WSP) seeks to gradually and permanently reduce per-capita water demand to help protect its water resources and long-term supply reliability. The plan includes a budget and five water saving measures Leavenworth has implemented to further the goal of using water efficiently and reducing water use.

One of the most important components of Leavenworth's WUE program is unaccounted for water. For the last several years Leavenworth has reported a high percentage of unaccounted for water (approximately 19.4% average over the last 3 years). The AMI meter replacement project is an integral component of Leavenworth's overall WUE planning in order to more closely and reliably track water usage and get a handle on its unaccounted-for water as well as customize conservation efforts, water rates, identify leak areas and plan repairs and maintenance accordingly.

E.1.6.2. Subcriterion F.2- Performance Measures

Points may be awarded based on the description and development of performance measures to quantify actual project benefits upon completion of the project. Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project.

As indicated in preceding sections, the replacement of Leavenworth's aging water meters with radio-read water meters will result in the City capturing and measuring customer water use that is currently unmeasured and therefore unaccounted for due to the City's current aged and inaccurate water meters. By measuring, documenting and charging for this current unmeasured water use, customers will respond by conserving water use in order to reduce the cost customers are paying for water. The resulting water use reduction / conservation will be an estimated 21.9 ac.-ft. per year based on a reduction in the City's annual unaccounted water from 12% per year down to 8%.

The performance measure procedure for documenting the annual water use savings will be:

1. Establish baseline years of pre-project unaccounted water:
    a. Use 2017, 2018, 2019 years as baseline years
    b. Calculate unaccounted for water for baseline years (as calculated from total water production less total water sales recorded uses)
    c. Report unaccounted for water in baseline years as % of total for each year and volume in ac.-ft. for each year
2. Determine post-project unaccounted for water for the transition period and subsequent normal operation years:
    a. Post project years:
        - 2020/2021 as transition year
        - 2022 as normal operation years
3. Calculate unaccounted for water for the post project years above (as calculated from total water production less total water sales recorded uses)
4. Report unaccounted for water for post project years as % of total for each year and volume in ac.-ft. for each year
        a. Prepare write-up of findings:
5. Compile and compare pre-project and post-project years unaccounted for water trends and document changes during pre and post period
        a. Report unaccounted for water as: (1) volume in ac.-ft./year; and (2) % of total water production per year
6. Report conclusions regarding success or failure to meet performance measures
7. Determine if other factors or investigations are needed to validate results

The above performance measure methodology will provide a definitive path for quantitatively measuring and documenting the actual water savings resulting from the water meter replacement project.

E.1.6.3. Subcriterion F.3 - Readiness to Proceed

Points may be awarded based upon the extent to which the proposed project is capable of proceeding upon entering into a financial assistance agreement.

Applicants that describe a detailed plan (e.g., estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates) will receive the most points under this criterion.

Project Timeline

The AMI Project will take less than 12 months for the installation of all meters within the City of Leavenworth Service Area with an anticipated substantial completion date of October 30, 2020 and a fully closed project by March 30, 2021.

Pre-construction activities to date include, but are not limited to, the preparations of cost estimates and specifications for contract advertisement, review of estimates of probable costs by equipment providers, propagation studies, and customer outreach. Propagations studies performed prior to the start of construction will determine the strategic placement of data collectors and installation to maximize effectiveness. The City intends to install all equipment and data collectors on City owned facilities and Right of Way. Propagation studies to date have indicated this work is possible to be completed on municipal property or right of way.

The construction phase of the Project entails the installation of the Base Stations and Booster Stations as determined by the propagation study. Upon installation of the data collectors the awarded vendor will proceed with the change out of change out of the residential and commercial meters within the Service Area. The vendor will work with the City's Public Works Department and Finance Department to develop and test software platform interface and train utility end users prior to activation. The City will initiate a public outreach and education effort to notify water system users of the new customer portal software, featuring tools to help customers better manage their own water usage.

Project Readiness

Task	2020				2021
	Q1	Q2	Q3	Q4	Q1
Finalize Propagation Study & RFP					
Advertise and Award Bid					
Press Release/Customer Notification					
Procure Meters					
Install Data Collectors					
Install Meters					
Set-up Customer Utility portal					
Staff Training					
Public Outreach and Education					
Project Closeout					

The proposed project will begin in 2020, following BOR notification of funding, and will be completed by 2021 (estimated 15-month timeframe). Upon execution of the grant award with the BOR, a contract will be awarded to the selected contractor who will manage all aspects of the project (including purchase, installation, integration, and testing of the AMI) with oversight from the City of Leavenworth. The AMI project will include the following tasks and generally proceed as follows:

- Fulfill environmental and cultural resource requirements.
- Finalize system design and cost with chosen contractor and AMI manufacturer.
- Notification of customers of the system upgrade and provide education regarding the logistics and benefits of the new system.
- AMI equipment installation.
- System start-up, commissioning, City staff training, and customer education.
- Final Report will be completed based on information and data collected after meters have been in place for a 12-month period.

Leavenworth's AMI project will have minimal, if any, impact on the surrounding environment, including ground-disturbing activities. The replacement of the City's meters will occur within existing meter vaults and meter receiving assemblies, and will not disturb the surrounding ground. Some disturbances will occur as needed for electrical conduit installation and other related activities, however, any ground that must be broken will be within existing streets or other manmade surfaces and will not have any known or significant impact on air, land, water, or wildlife habitat.

Leavenworth City staff will provide administrative oversight for the project. Activities will include reviewing and executing the grant agreement and contract, attending (and preparing for) requested meetings with the Bureau of Reclamation (BOR), maintaining grant and project files, preparing and processing requests for reimbursements, preparing updates for the City Council,

ensuring grant agreement compliance, completing and submitting quarterly and final reports as outlined in the grant agreement, coordinating any audit request and/or examination of records by BOR or independent auditors, and maintaining all records after the project is closed out.

Additional detailed scope of work and task descriptions are included in the Project Budget section of this application.

E.1.7. Evaluation Criterion G – Nexus to Reclamation Project Activities (4 Points)

Up to 4 points may be awarded if the proposed project is in a basin with connections to Reclamation project activities. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.

Is the proposed project connected to Reclamation project activities? If so, how?

This project is a part of the Icicle Strategy's "base package" preferred alternative identified in the Final PEIS of projects developed to resolve longstanding water resource conflicts within the Icicle Creek basin. The City of Leavenworth along with the Bureau of Reclamation and US Fish and Wildlife Service are, among others, members of the Icicle Work Group. Reclamation funds the Leavenworth National Fish Hatchery as part of three hatcheries that make up the Leavenworth Complex. This hatchery is operated by USFWS to produce spring Chinook salmon. These hatcheries are part of an extensive FCRPS (Federal Columbia River Power System) hatchery program funded by BPA, USACE, and Reclamation. One of the Icicle Work Group's (IWG) guiding principles is a Sustainable Hatchery with several projects on the "base package" identified to meet this goal. The IWG supports implementing this strategy so all guiding principles are met, meaning that implementation of domestic conservation and hatchery conservation projects are linked.

- *Does the applicant receive Reclamation project water?*

No

- *Is the project on Reclamation project lands or involving Reclamation facilities?*

No

- *Is the project in the same basin as a Reclamation project or activity?*

Yes. The City of Leavenworth has a water source on Icicle Creek just upstream from the Leavenworth National Fish Hatchery which is funded by Reclamation as mitigation for the construction of Grand Coulee Dam. The City of Leavenworth, Reclamation, and US Fish and Wildlife Service, who manages LNFH, are all members of the Icicle Work Group working collaboratively on Icicle Water Management solutions.

- *Will the proposed work contribute water to a basin where Reclamation project is located?*

Yes. Water conserved by this project will remain in Icicle Creek when not needed.

- *Will the project benefit any tribe(s)?*

Yes. This project is a part of the Icicle Strategy. One goal of this effort is to protect the tribal fishery. Any instream flow improvements will improve conditions for the tribal fishery as well as help meet the collective goals of the Strategy. Yakama Nation and Colville Confederated Tribes have usual and accustomed fishing areas in Icicle Creek.

The goals of the Icicle Work Group (IWG) clearly state that all Tribal Treaty and federally-protected fishing/harvest rights must be met at all times. This means that the IWG is committed to ensure that none of the projects implemented will adversely impact these rights. A sustainable hatchery is also a goal of the Icicle Strategy that produce spring Chinook salmon that help fulfill harvest rights.

E.1.8. Evaluation Criterion H- Additional Non-Federal Funding (4points)

Up to 4 points may be awarded to proposals that provide non-Federal funding in excess of 50 percent of the project costs. State the percentage of non-Federal funding provided using the following calculation:

Non-Federal Funding	$630,695
Total Project Cost	$975,000

Leavenworth proposes a 64% non-federal funding share for the project. The City is also self-performing an additional $44,305 (additional 4.5%) of work for: (1) project management/oversight, (2) In-house construction installation of portions of the work, and (3) environmental and regulatory compliance.

- *Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?*

Yes. The projects within the Icicle Strategy also consist of water conservation for rural residential water users, for irrigation districts and for the Leavenworth National Fish Hatchery. All water users are members of the Icicle Work Group and support each other's projects to help meet all of the goals identified in the guiding principles.

Project Budget

The City of Leavenworth's project for installing radio-read water meters has a total estimated cost of $975,000. The City has carefully thought through the scope of work required, the necessary commitment of City staff resources required for completion and has prepared a budget for successful completion of the project. The following includes the project budget information required under the funding application guidelines.

Funding Plan and Letters of Commitment

The total estimated project budget is $975,000. The following table shows the sources of funding proposed for the project.

Summary of Non-Federal and Federal Funding Sources

City of Leavenworth Radio-Read Water Meter Project

FUNDING SOURCES	TOTAL COST
Non-Federal Entities	
1. City of Leavenworth In-kind (for City Provided Project Mgt and Support)	$7,277
2. City of Leavenworth contribution (for City Provided / In-House Construction Installation Assistance)	$27,028
3. City of Leavenworth cash reserves (for 60% of contracted amount for meters installation)	$630,695
4. City of Leavenworth contribution for environmental and regulatory compliance	$10,000
Non-Federal Subtotal	**$675,000**
Other Federal Entities	
1. N/A	
2. N/A	
3. N/A	
Other Federal Subtotal	**$0.00**
REQUESTED RECLAMATION FUNDING	**$300,000**
TOTAL PROJECT	**$975,000**

All non-Federal share of the costs shown in the table above are committed authorized for immediate use on the project:

- Items 1 and 2 under the non-Federal share, total $34,305 and are for work to be performed by the City using City forces and equipment.
- Item 3 under the non-Federal share for $630,695 is the City's funding participation in the project. The City has sufficient revenues and reserves to cover the funds. See City commitment of funds letter included in the Documentation.

- Item 4 under the non-Federal share for $10,000 is a contribution from City reserves as needed for environmental and regulatory compliance per the funding application guidelines.

There are no other constraints or contingencies with the non-Federal funding share. With the granting of this funding request, the City will have all necessary funds and are ready to begin immediately with project implementation steps.

Additional information required for submittal per the funding guidelines:

- As indicated above, the City has the resources and authorization to make the contributions and cost-share amounts as shown.
- The City does not anticipate seeking reimbursement for any costs incurred before the anticipated Project start date, January 2020.
- There are no other committed funding partners participating in this project at this time, the City is seeking funding from the Icicle Work Group/Office of the Columbia River. That request was not granted in March 2019. However, a new request has been made in September of 2019.
- There are no other Federal partners involved in this project.

Budget Proposal

The City has prepared the following:

- Project Budget Proposal (next page) for the project in accordance with the funding application guidelines and cost categories required
- Project Scope / Description (2nd page following) depicting the tasks and work items anticipated for the project.

The required Project Budget Proposal has been prepared based on the Project Scope / Description items. The Budget Proposal tasks (column 1) are based on the tasks identified in the Project Scope / Description table.

As indicated in the preceding paragraphs and table, $34,305 of the total project cost are in the form of in-kind and/or cash contributions by the City. The in-kind contributions are in addition to the required cash contribution the City is making directly toward the radio-read hardware and software system being provided by contract (and the portion being requested for 31% funding via this application). The City is not pursuing use of the in-kind contribution as contributing to the minimum monetary share required for the project.

Project Scope / Description

City of Leavenworth AMI Water Meter Project

Task	Work Task Scope / Description	Type	Units	Amount
1	**City Provided Project Management and Support (In-kind)**			
1.1	Coordination, administration and oversight of contractor and contract completed work	Pub Works Dir(Herb.Amick)	Hrs.	40
1.2	Budget monitoring, financial tracking and reporting of all project expenditures	City Clerk (Chantell Steiner)	Hrs.	40
1.3	Field inspection and monitoring of Contractor completed work	Wtr Maint Staff (various staff)	Hrs.	100
1.4	Start-up and training; system take-over; operations	Pub Works Dir (Herb Amick)	Hrs.	20
		Wtr Maint Staff (various staff)	Hrs.	40
1.5	Project close-out	Pub Works Dir (Herb Amick)	Hrs.	20
		City Clerk (Chantell Steiner)	Hrs.	20
2	**City Provided / In-House Construction Installation Assistance**			
2.1	City provided construction support for various installation of components, trench excavation, site preparation work, unforseen and additional support as needed.			
2.2	--City maintenance staff estimated const. assistance	Wtr Maint Staff (various staff)	Hrs.	80
2.3	--Estimated backhoe construction allowance	City Equipment	Hrs.	60
2.4	--Estimated dump truck allowance	City Equipment	Hrs.	50
2.5	--Miscellaneous/contingency/misc. assistance	Misc. allowance	Misc	$6,379
3	**Ferguson Waterworks - Meter & Automation Group**			
3.1	Base Stations, Booster Stations, Software, Sensus Analytics	Contractor	Lump Sum	$203,212
3.2	On-site training	Contractor	Lump Sum	$11,000
3.3	Residential Meters ¾ - 1 inch Purchase	Contractor	1228	$184,413
3.4	Commercial Meters 1.5 to 3 inch meter size Purchase	Contractor	153	$170,381
3.5	520M Single Point Smartpoints	Contractor	1381	$216,817
3.6	Meter Installation	Contractor	1381	$144,872
4	**City Conduct Environmental Process**			
4.1	City conduct environmental and regulatory compliance process. City will employ in-house staff expertise for completion. Per application requirements, a minimum of 1% to 2% allowance required (or more if potential impacts warrant)	City Staff	Misc	$10,000

Project Budget Proposal

City of Leavenworth AMI Water Meter Project

TASK	BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
		$/Unit	Quantity		
	Salaries and Wages				
1	City Provided Project Mgt and Support:				
1.2, 1.5	City Clerk / Treasurer (Chantell Steiner)	$43.85	60	Hours	$2,631
1.1, 1.4, 1.5	Director of Public Works (Herb Amick)	$41.54	80	Hours	$3,323
1.4	City Water Maintenance Staff (various)	$26.00	140	Hours	$3,640
	City Provided/In-House Const Installation Assist				
2.2	City Water Maintenance Staff (various)	$26.00	80	Hours	$,2080
		Total hrs	360		
	Fringe Benefits				
	City Clerk / Treasurer (Chantell Steiner)	$10.21	60	Hours	$613
	Director of Public Works (Herb Amick)	$8.87	80	Hours	$710
	City Water Maintenance Staff (various)	$8.77	220	Hours	$1,929
		Total hrs	360		
	Travel				
	N/A				
	N/A				
	Equipment				
	N/A				
	N/A				
	Supplies and Materials				
	N/A				
	N/A				
	Contractual/Construction				
3	Ferguson Waterworks - Meter & Automation Group	$930,695	1	Lump Sum	$930,695
	Other				
2	City Provided / In-House Const. Installation Assist.:				
2.3	--City backhoe (including operator)	$150.00	60	Hours	$9,000.00
2.4	--City dump truck (including operator)	$80.00	50	Hours	$4,000.00
2.5	--Miscellaneous/contingency/assistance	$6,379.00	1	Allowance	$6,379.00
	Environmental and Regulatory Compliance				
	Budget allowance = 1.1% for environ. / reg. compliance (guidelines min. = 1% to 2%)	$10,000.00	1	Allowance	$10,000.00
	TOTAL DIRECT COSTS				**$975,000**
	Indirect Costs				
	N/A				
	TOTAL ESTIMATED PROJECT COSTS				**$975,000**

Budget Narrative

Salaries and Wages
Salaries and wages have been identified in the budget based on the anticipated City staff work and involvement for the project. The hour estimates are based on the scope description included in the Project Description section of this application. The hourly rates shown are actual rates for the City staff persons shown.

Fringe Benefits
Fringe benefit rates are included and are based on inclusion of: FICA/Medi (7.65%), unemployment/L&I taxes, Medical/Dental/Vision/VEBA. The rates are fixed (not just for this funding application) and are the rates charge when work done for reimbursement.

Travel
No travel is anticipated. N/A.

Equipment
No equipment purchases are anticipated. N/A.

Materials and Supplies
No additional materials or supplies are anticipated. N/A.

Contractual
A significant portion of the work associated with the City's radio-read project will be contracted. The project budget is based on scoping and assistance from Ferguson Waterworks – Meter and Automation Group. The contractor will be providing the radio-read system, metering equipment, base stations, software, installation, training and startup. The City has an ongoing working relationship with Ferguson Waterworks as the current provider of the City's existing Sensus water meters, and has been working with Ferguson in budgeting and scoping the work to be done for replacement of the existing meters with the radio-read system. A copy of the budget estimate is included in the Documentation with this funding application. The City has evaluated various radio-read systems and confirmed the budget figures developed are fair and reasonable for the package being considered. In addition, the City's current water meters are Sensus brand meters and the City will replace their current meters with a compatible meter in order to utilize the existing infrastructure and hardware in their system. Ferguson Waterworks
is the Sensus meter distributor in the region.

Other Expenses
As indicated in the Project Description section, a significant construction assistance element of the work will be accomplished by the City using City forces and equipment. This section includes the equipment rental costs and a contingency allowance for miscellaneous assistance.

Environmental and Regulatory Compliance Costs
An allowance of $10,000 (1.0 2%) has been included and shown for environmental and regulatory compliance costs. The project consists of replacing / installing new water meters in existing water

meter vaults and receivers where no ground disturbing activities will occur. Base station antennas will be installed / anchored to existing structures and/or utility poles and will not result in ground disturbing activities. Ground disturbing activities will occur, as needed, for electrical conduit installation and other related activities. These activities will occur at facilities and/or in existing roadways where existing structures and previous construction has occurred. No new construction is anticipated in sensitive or virgin areas. It is anticipated minimal environmental review will be required and that most or all activities will receive a categorical exemption. Thus, the amount budgeted appears to be reasonable and within the range included in the funding application guidelines.

Indirect Costs

No indirect costs are being included. N/A.

City of Leavenworth
700 Highway 2 / Post Office Box 287
Leavenworth, Washington 98826
(509) 548-5275 / Fax: (509) 548-6429
Web: www.cityofleavenworth.com

City Council
Cheryl K. Farivar - *Mayor*
Carolyn Wilson - *Mayor Pro Tem*
Mia Bretz
Margaret Neighbors
Sharon Waters
Clint Strand
Jason Lundgren
Joel Walinski – *City Administrator*

September 30, 2019

Bureau of Reclamation
Financial Assistance Management Branch
PO Box 25007
Denver C080225

To Whom it May Concern,

City of Leavenworth is a political subdivision within the State of Washington and is a local government entity. The City of Leavenworth is funded with a property tax base, sales tax revenues, and revenues from the operation of the City's Water Utility. These provide an adequate source of revenues and reserve funds for the cost share of the grant proposal. The City has a commitment of funds to cover the $630,695 for its share of the project. We do not anticipate any delays in scheduling or funding of this project which would preclude the City from meeting all requirements of the grant funding.

As shown in the Proposed Budget table, the total project cost is projected to be $975,000 which includes replacement of all meters, installation of smart read system and training for staff. The new meter and read system should provide meter and leak detection equipment, year round meter reading capabilities, and improved efficiency with data collection The City's commitment and contribution will include project administration, in-kind labor contributions and monetary funds as needed to include the identified cost share commitment and other contingency funding as a final cost of the project is developed.

The City is committed to managing and conserving the water resources under its jurisdiction to the best of its ability. This project allows for enhanced management of the City's water resources and provides information to our residents for improving water conservation and efficiency. The City looks forward to partnering with the Bureau of Reclamation to complete this project and looks forward to opportunities to work with the Bureau on issues affecting Icicle Creek.

Respectfully,

Joel Walinski
City Administrator

CC: Mayor Cheryl K. Farivar

Environmental and Cultural Resources Compliance

- ***Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.***

Leavenworth's AMI project will have minimal, if any, impact on the surrounding environment, including ground-disturbing activities. The replacement of the City's meters will occur within existing meter vaults and meter receiving assemblies, and will not disturb the surrounding ground. Some disturbances will occur as needed for electrical conduit installation and other related activities, however, any ground that must be broken will be within existing streets or other manmade surfaces and will not have any known or significant impact on air, land, water, or wildlife habitat.

- ***Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?***

No, it is not anticipated that any species would be negatively affected by any activities associated with the proposed project. Conservation of instream flow will only enhance the habitat of the critical habitat.

- ***Are there wetlands or other surface waters inside the project boundaries that potentially fall under Clean Water Act (CWA) jurisdiction as "Waters of the United States?" If so, please describe and estimate any impacts the proposed project may have.***

This project will not have any known or expected impact on wetlands, surface waters or other waters of the US.

- ***When was the water delivery system constructed?***

The majority of Leavenworth's water system was constructed during the 50's, and 60's. The City has since gradually updated the system and constructed or added new facilities. The City's Capital Facility Plan contains prioritization for replacing the remaining water mains from the 50's and 60's.

- ***Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.***

No.

- ***Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.***

Historical buildings and features within the City will not be affected by this project.

- ***Are there any known archeological sites in the proposed project area?***

Archeological sites within the City will not be affected by this project.

- ***Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?***

No.

- ***Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?***

No.

- ***Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?***

No.

Required Permits or Approvals

The proposed AMI project will require a permit issued by the City of Leavenworth required for repairs and maintenance within City right-of-way. All equipment will be attached to previously installed water meters and infrastructure. No additional approvals are anticipated at this time. The City anticipates that if any approvals become necessary, they will be handled by City of Leavenworth staff in an efficient and timely manner.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

March 15, 2019

Darren Olson
Bureau of Reclamation
Financial Assistance Support Section
P.O. Box 25007, MS 84-27814
Denver, CO 80225

RE: City of Leavenworth Water and Energy Efficiency Project

Dear Darren Olson:

On behalf of the members of the Icicle Work Group, we are pleased to submit this letter of support for the City of Leavenworth's application to the Bureau of Reclamation's WaterSMART grant program for a Water and Energy Efficiency Project. Leavenworth's proposal includes replacement of old residential water meters with an advanced metering infrastructure (AMI) that would result in greater water conservation.

The Icicle Work Group was formed in December 2012 to "find collaborative solutions for water management within the Icicle Creek drainage" while meeting the various needs and interests within the basin. The Icicle Work Group has made great progress over six years and has developed a strategy that will result in lasting solutions in the basin. Chelan County and Washington State's Department of Ecology's Office of Columbia River recently released a Final Programmatic Environmental Impact Statement (FPEIS), prepared in compliance with the Washington's State Environmental Policy Act (SEPA) with the County and Ecology acting as co-lead agencies. The Plan's preferred alternative identifies a mix of projects to achieve reliable water supplies and instream flows. The City of Leavenworth's meter replacements and efficiency project is included in this preferred alternative and is a critical component of our long-term strategy.

The Icicle Work Group has also indicated that it will endorse financial support, up to 25 percent cost-share of the project cost or approximately $250,000, for this project by allocating funds

from the Icicle Strategy's portion of Ecology's Office of Columbia River budget for the 2019-2021 fiscal biennium. The state cost share is contingent upon legislative appropriation during the 2019 calendar year (for the 2019 – 2021 state capital budget cycle).

The Icicle Work Group is made up of a diverse set of stakeholders including four major water right holders within Icicle Creek: City of Leavenworth, Icicle Peshastin Irrigation District, Cascade Orchard Irrigation Company and the Leavenworth National Fish Hatchery. Members also include federal, state and local agencies, Tribes and environmental organizations. Reclamation is a member of the Icicle Work Group as it funds the Leavenworth National Fish Hatchery which is operated by the U.S. Fish and Wildlife Service.

We hope that Reclamation will support this project and the efforts of the Icicle Work Group. The workgroup values the opportunity to cost share on this conservation and efficiency project to address water supply needs in the Icicle Basin. Please let us know if we can provide any additional information.

Thank you for your consideration.

Sincerely,

G. Thomas Tebb, L.H.g., L.E.G.
Director Office of Columbia River
Co-convener, Icicle Work Group

Mike Kaputa, Director
Chelan County Natural Resource Dept.
Co-convener, Icicle Work Group

GT:cms (190306)

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
EASTERN DRINKING WATER REGIONAL OPERATIONS
16201 E Indiana Avenue, Suite 1500, Spokane Valley, Washington 99216-2830
TTY Relay 1-800-833-6384

October 1, 2019

Mr. Darren Olson
US Bureau of Reclamation
Financial Assistance Support
PO Box 25007, MS 84-27814
Denver, CO 80225-0007

Subject: City of Leavenworth Water System; PWS ID #465005; Chelan County
Letter of Support – Grant Funding for Water Meter System Replacement

Dear Mr. Olson:

The Department of Health, Office of Drinking Water supports the City of Leavenworth's application for the US Bureau of Reclamation's WaterSMART grant. The City intends to use this grant to help fund a project to replace its old, unreliable meters with new meters that can be read remotely. The project will also include radio system infrastructure to collect the readings in one centralized location on a continuous basis.

Having continuous water use data for all customers allows important public health and water use conservation goals to be met. On the public health side, such a continuous meter read system allows immediate detection and response to backflow incidents. Water coming back into the water system from a customer's plumbing is a serious health risk, and a continuous meter read system can alert the water system operator immediately if a meter starts running backwards so that they can solve the problem quickly to best protect public health.

On the water conservation side, the continuous meter read system can quickly identify customers that have leaks on their property, from large irrigation leaks to a toilet with a fill valve that gets stuck open. This allows the water system to notify customers who have suspected water leaks and then the leaks can be repaired in a timely manner, resulting in significant reductions in water usage.

Please feel free to contact me should you have any questions.

Sincerely,

Jeff Johnson, PE
Regional Engineer
Office of Drinking Water
Division of Environmental Public Health
(509) 329-2110

cc: Mr. Joel Walinski, City Administrator, City of Leavenworth, Washington

PATTY MURRAY
WASHINGTON

COMMITTEES:
APPROPRIATIONS
BUDGET
HEALTH, EDUCATION, LABOR, AND PENSIONS
VETERANS' AFFAIRS

United States Senate

WASHINGTON, DC 20510–4704

May 31, 2019

The Honorable Brenda Burman
Commissioner
Bureau of Reclamation
1849 C Street NW
Washington, D.C. 20240

Dear Commissioner Burman:

I am writing in support of an application submitted by the City of Leavenworth for the Bureau of Reclamation's *WaterSMART Water and Energy Efficiency Grants* program. Should it be approved, the grant will allow the City of Leavenworth to upgrade and replace all water meters within its service area.

Currently, the City's ability to manage and conserve the water resources under its jurisdiction is constrained by its existing meter and read system. Presently, residential meters are read between May and October and only commercial meters are read year-round. The new meter and read system that would be supported by this grant would provide meter and leak detection equipment, year-round meter reading capability, and improved data collection. Furthermore, the conservation gains that result from this new system will serve to benefit the City's watershed and the fish hatcheries that rely upon it.

The City of Leavenworth is confident that it will be able to commit the funds necessary to cover its share of the grant proposal without delay and that its revenue base can adequately meet any other cost demands of the project, including reserve funds. Beyond funding, the City is willing and capable of providing the requisite administration, in-kind labor contributions, and other resources to successfully execute the grant and deploy its new meter and read system.

Taken together, I believe the meter and read system that would be funded by this grant constitutes a sound investment by the City of Leavenworth and will benefit the economic and environmental health of the region. Thank you for your consideration of the City of Leavenworth's application. Please contact Flannery Fox in my Washington, D.C. office at 202-224-2621 with any questions.

Sincerely,

Patty Murray
United States Senator

154 RUSSELL SENATE OFFICE BUILDING
WASHINGTON, DC 20510–4704
(202) 224–2621

2930 WETMORE AVENUE
SUITE 903
EVERETT, WA 98201–4107
(425) 259–6515

2988 JACKSON FEDERAL BUILDING
915 2ND AVENUE
SEATTLE, WA 98174–1003
(206) 553–5545
TOLL FREE: (866) 481–9186

10 NORTH POST STREET
SUITE 600
SPOKANE, WA 99201–0712
(509) 624–9515

950 PACIFIC AVENUE
SUITE 650
TACOMA, WA 98402–4450
(253) 572–3636

THE MARSHALL HOUSE
1323 OFFICER'S ROW
VANCOUVER, WA 98661–3856
(360) 696–7797

website: http://murray.senate.gov
e-mail: http://murray.senate.gov/email

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402 EAST YAKIMA AVENUE
SUITE 420
YAKIMA, WA 98901–2760
(509) 453–7462

KIM SCHRIER
8TH DISTRICT, WASHINGTON

1123 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
(202) 225-7761

Congress of the United States
House of Representatives
Washington, DC 20515–4708

March 18, 2019

Mr. Darren Olson
Bureau of Reclamation
Financial Assistance Support
PO Box 25007, MS 84-27814
Denver, CO 80225-0007

Dear Mr. Olson,

I respectfully request support for the City of Leavenworth's application for the US Bureau of Reclamation WaterSMART Water and Energy Efficiency grant. I firmly believe that this grant, if provided, will significantly improve the city's water system efficiency, leak detection, and data collection.

The City completed a thorough Water System Plan in 2018 with the objective of providing the best possible service at the lowest possible cost consistent with sound business principles. The Water Plant Division supplies water to approximately 2,559 people in the City and its urban growth area. The City currently meters all service connections. Customer types include a combination of residential and commercial connections. Over the past three years the City has produced an average of 320 million gallons annually.

Leavenworth's current water service meter system is nearly 30 years old. In recent years the City's distribution system leakage (DSL) has increased considerably. The Water System Plan finds the primary reason for increased DSL is failing service meters causing them to under read water sold. With a grant though the Bureau of Reclamation WaterSMART program, the City plans to replace all service meters citywide within approximately 2 years with new state of the art smart read meters that will provide meter and read detection equipment. These new meters will have year-round meter reading capabilities that will improve efficiency, leak detection, and data collection.

The City has committed $550,000 towards this project and is seeking additional funding through the Icicle Work Group in addition to Reclamation WaterSMART funds. Total project cost is $900,000. This project has support from Chelan County and Washington Department of Ecology's Office of Columbia River. The County and Ecology formed the Icicle Work Group in December 2012 to find collaborative solutions for water management within the Icicle Creek Watershed. Leavenworth's proposed water meter replacement project will greatly advance the health, safety, and economic welfare of this community for decades to come.

Thank you for your consideration of this application. My office can be reached at (202) 225-7761 or Wendy.Muzzy@mail.house.gov for further questions or information.

Sincerely,

Kim Schrier, M.D.
Member of Congress

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RESOLUTION NO. 12 – 2019

A RESOLUTION OF THE CITY OF LEAVENWORTH, WASHINGTON ENDORSING WATERSMART: WATER AND EFFICIENCY GRANTS FOR FISCAL YEAR 2020

WHEREAS, the United States Federal Department of the Interior, Bureau of Reclamation, is currently offering grant opportunities through the WaterSMART: Water and Energy Efficiency Grants for Fiscal Year (FY) 2020; and

WHEREAS, said WaterSMART: Water and Energy Efficiency Grants for FY 2020 is a cost-shared program emphasizing water and energy efficiency; and

WHEREAS, The City of Leavenworth City Council supports the submission by the City of Leavenworth grant application, prepared and approved by the City Council to the WaterSMART: Water and Energy Efficiency Grants for FY 2020; and

WHEREAS, the City of Leavenworth is capable of providing the amount of matching funds of up to $675,000 in cash as specified in the grant application; and

WHEREAS, if selected for a WaterSMART: Water and Energy Efficiency Grant for FY 2020, the City will work with the United States Bureau of Reclamation to meet established deadlines for entering into a cooperative agreement.

NOW, THEREFORE, THE CITY OF LEAVENWORTH CITY COUNCIL DOES HEREBY RESOLVE, ORDER AND DETERMINE AS FOLLOWS:

Section 1: The City of Leavenworth City Council authorizes submission of the WaterSMART; Water and Energy Efficiency Grants for FY 2020 by the City of Leavenworth for a funding request of up to $300,000 in grant funding.

Section 2: The City of Leavenworth will comply with applicable provisions of the WaterSMART: Water and Efficiency Grant, and agrees to provide the non-Federal share of the project costs at the same or greater rate as the Federal share of the project cost to provide matching funds up to the amount of $675,000.

Section 3: The City of Leavenworth will work with the Bureau of Reclamation to meet established deadlines for entering into a grant or cooperative agreement.

Section 4: The City of Leavenworth designates Mayor Cheryl K. Farivar as the authorized Chief Administrative Official and the authorized representative to act in all official matters in connection with this application and the City of Leavenworth's participation in the Federal Department of

Interior, Bureau of Reclamation, Policy and Administration, WaterSMART: Water and Efficiency Grant FY 2020.

Passed by the City Council of the City of Leavenworth and approved by the Mayor in an open public meeting on the 10th day of September, 2019.

APPROVED:

Cheryl K. Farivar, Mayor

ATTEST:

Chantell R. Steiner, Finance Director/City Clerk

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Date Submitted: 5/3/2019

Water Use Efficiency
Annual Performance Report - 2018

WS Name: LEAVENWORTH CITY OF Water System ID# : 46500 WS County: CHELAN

Report submitted by: *Arnica Briody*

Meter Installation Information:

Estimate the percentage of metered connections: *100%*

If not fully metered - Current status of meter installation:

Production, Authorized Consumption, and Distribution System Leakage Information:

12-Month WUE Reporting Period: *01/01/2018* To *12/31/2018*

Incomplete or missing data for the year? *No*

If yes, explain:

Distribution System Leakage Summary:

Total Water Produced and Purchased (TP) – Annual Volume	*310,989,500* gallons
Authorized Consumption (AC) – Annual Volume	*239,283,808* gallons
Distribution System Leakage – Annual Volume TP – AC	*71,705,692* gallons
Distribution System Leakage – Percent DSL = [(TP – AC) / TP] x 100	*23.1 %*
3-year annual average	*19.4 %*

Goal-Setting Information:

Date of Most Recent Public Forum: *06/28/2016* Has goal been changed since last performance report? *Yes*

Note: Customer goal must be re-established every 6 years through a public process

WUE Goals:

Customer Goal (Demand Side):

To correctly and accurately collect water usage in the water system by replacing water meters in the next three years.

Describe Progress in Reaching Goals:

Customer (Demand Side) Goal Progress:

Our previous goal has been met. Now it is time to accurately see how much water is being used by the customers with new water meters installed. Once we have an accurate figure for how much water is being used in the system, then we can work towards water use efficiency goals for our water users.

Additional Information Regarding Supply and Demand Side WUE Efforts

Include any other information that describes how you and your customers use water efficiently:

Do not mail, fax, or email this report to DOH

FERGUSON WATERWORKS

City of Leavenworth

AMI Budget Proposal

September 13,2019

Valid: 90 days

Hand Helds

		Each	Extended
1	FL6501GB hand held	$ 9,601.00	$ 9,601.00

(already purchased command links)

Sub Total Hand Held	**$**	**9,601.00**

METERS AND SMARTPOINTS

	Residential Meters	EACH	EXTENDED
1095	3/4S Iperl TRPL 1000G	$ 144.00	$ 157,680.00
133	1" Iperl TRPL 1000G	$ 201.00	$ 26,733.00
			$ 184,413.00

	1.5-3" Commercial Meters	EACH	EXTENDED
38	1.5" Omni C2	$ 1,279.00	$ 48,602.00
39	1.5" Omni T2	$ 875.00	$ 34,125.00
13	2" Omni C2	$ 1,476.00	$ 19,188.00
51	2" Omni T2	$ 1,038.00	$ 52,938.00
12	3" Omni T2	$ 1,294.00	$ 15,528.00
			$ 170,381.00

	Smartpoints	EACH	EXTENDED
1381	**520M Single Port Smartpoints**	$ 157.00	$ 216,817.00

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Sub total Meters and Smartpoints	**$**	**581,212.00**

tammy.rogers@ferguson.com/503-209-4902

FERGUSON WATERWORKS

AMI Implementation				
Bundle 1: RNI SaaS + Sensus Analytics		**One-Time Fees**		**Annual Fees**
Annual RNI SaaS Fee			$	8,240.00
RNI SaaS Setup Fee [5]	$	7,957.00		
Training (RNI Core Education - Onsite)	$	5,500.00		
Sensus Analytics Enhanced			$	6,758.00
Sensus Analytics Setup Fee	$	4,000.00		
Sensus Analytics basic Integration [1,2]	$	4,000.00		
Sensus Analytics (On-site Training)	$	5,500.00		
		26,957.00		14,998.00
Subtotal Analytics		**41,955.00**		

Base Stations		
City Hall (Mounted on Building)		
M400B2 Base Station	$	28,648.00
Antenna	$	1,876.00
Modem	$	2,143.00
Base station installation	$	31,429.00
Base station Annual Maintenance Agreem	$	1,717.00
Subtotal City Hall Install	**$**	**65,813.00**
Booster Station (Mounted on Pole)		
M400B2 Base Station	$	28,648.00
Antenna	$	1,876.00
Modem	$	2,143.00
Base station installation	$	42,858.00
Base station Annual Maintenance Agreem	$	1,717.00
Subtotal Booster Station Install	**$**	**77,242.00**

Exceptions

Pricing is subject to change upon site visit and stamped engineer drawings

Project Management	$	10,000.00
Total Meters & AMI Implementation	**$**	**785,823.00**

tammy.rogers@ferguson.com/503-209-4902

AMI Implementation Exceptions

	Any additional training beyond the initial	
*	On-site Training	$1,750.00
**	If required add for Insurance and bonds	$6,400.00
***	All pricing subject to approval	
****	Pricing based on information provided	
*****	Approved scope of work required prior to final contract pricing.	

By others:

Any modifications to Utility Billing

building permits

any site electrical modification by the city

Backhaul by the city (modems and any accrued fees)

Any optional site modification by the city

Any Fee's required by Utility billing company

Any CUP permit

Any Enginner drawings

ANNUAL FEE'S FOR AMI

5 Year Agreement required

Required Annual fees years 2-5

Year 2	$	18,766.00
Year 3	$	19,332.00
Year 4	$	19,914.00
Year 5	$	20,517.00

Annual Fee's include:

Base station annual Maitenance

RNI Annual SaaS Fee

Analytics Enhanced Annual fee

tammy.rogers@ferguson.com/503-209-4902

FERGUSON

Meter Installation

FOR BUDGET PURPOSES ONLY!!

		Each	Extended
1095	3/4 Meters	$ 75.00	$ 82,125.00
133	1" Meter Change out	$ 82.00	$ 10,906.00
77	1 1/2 meter change out	$ 309.00	$ 23,793.00
64	2" Meter change out	$ 309.00	$ 19,776.00
12	3" Meter change out	$ 481.00	$ 5,772.00
1	Mobilization		$ 2,500.00

Total Installation	$ 144,872.00

Add as required	Each
Lid Cut	$ 10.00
Staging Location per week	$ 313.00
Plastic Lid Cut	$ 6.25
Lid Swap	$ 6.25
Excessive Digging(billed per 1/4hr)	$ 62.50
3/4" valve change	$ 62.50
1" Valve Change	$ 81.25
Modify small Meter can	$ 31.25
Raise small Meter Can	$ 31.25
Replace Meter Can	$ 62.50
Reset Meter Can	$ 62.50
Additional Plumbing repairs (per hour)	$ 125.00
Customer Notifications cards per each	$ 1.88
Additional Re-Mobilization	$ 1,250.00

Terms and conditions:

Assumes staging location provided by the city. PMI Will supply one storage container.

Additional cost provided for independent staging location

All meters and additional parts will be provided by others, and in sufficient quantity to complete project in one Mobilization.

Assumes Laborer Prevailing Wage

Assumes no special license required to install meters

If use of licensed plumber required, additional charge of $188.00 per hour

tammy.rogers@ferguson.com/503-209-4902

Total Project w/Installation	**$**	**930,695.00**

** Final price based on approved Scope of Work

***All prices submitted less WA State tax

Thank you for the opportunity to work with you on your project!

Tammy Rogers

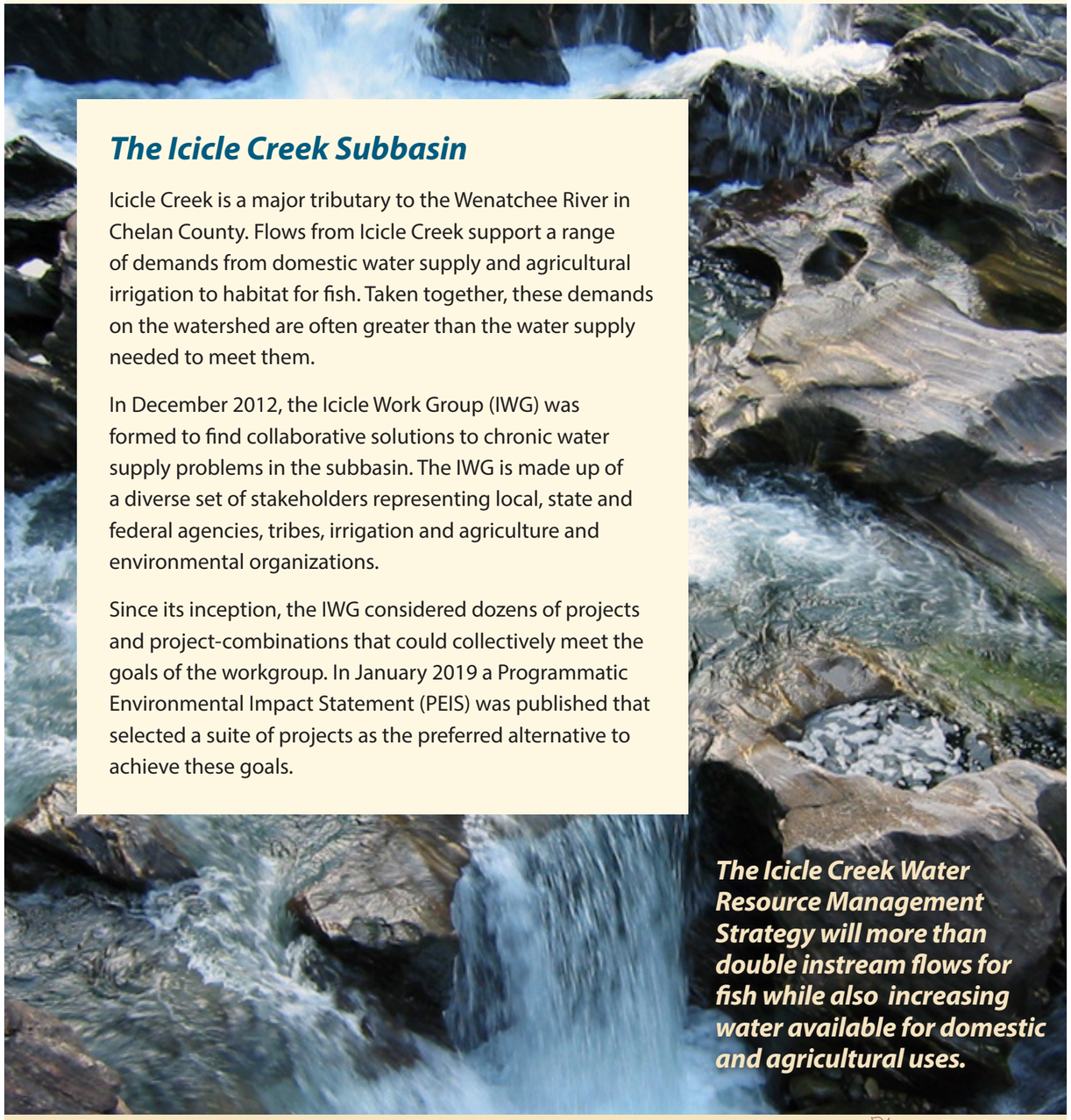
tammy.rogers@ferguson.com/503-209-4902

Icicle Strategy

Revitalizing Icicle Creek - Increasing Water Supply

ICICLE WORK GROUP

JULY 2019



The Icicle Creek Subbasin

Icicle Creek is a major tributary to the Wenatchee River in Chelan County. Flows from Icicle Creek support a range of demands from domestic water supply and agricultural irrigation to habitat for fish. Taken together, these demands on the watershed are often greater than the water supply needed to meet them.

In December 2012, the Icicle Work Group (IWG) was formed to find collaborative solutions to chronic water supply problems in the subbasin. The IWG is made up of a diverse set of stakeholders representing local, state and federal agencies, tribes, irrigation and agriculture and environmental organizations.

Since its inception, the IWG considered dozens of projects and project-combinations that could collectively meet the goals of the workgroup. In January 2019 a Programmatic Environmental Impact Statement (PEIS) was published that selected a suite of projects as the preferred alternative to achieve these goals.

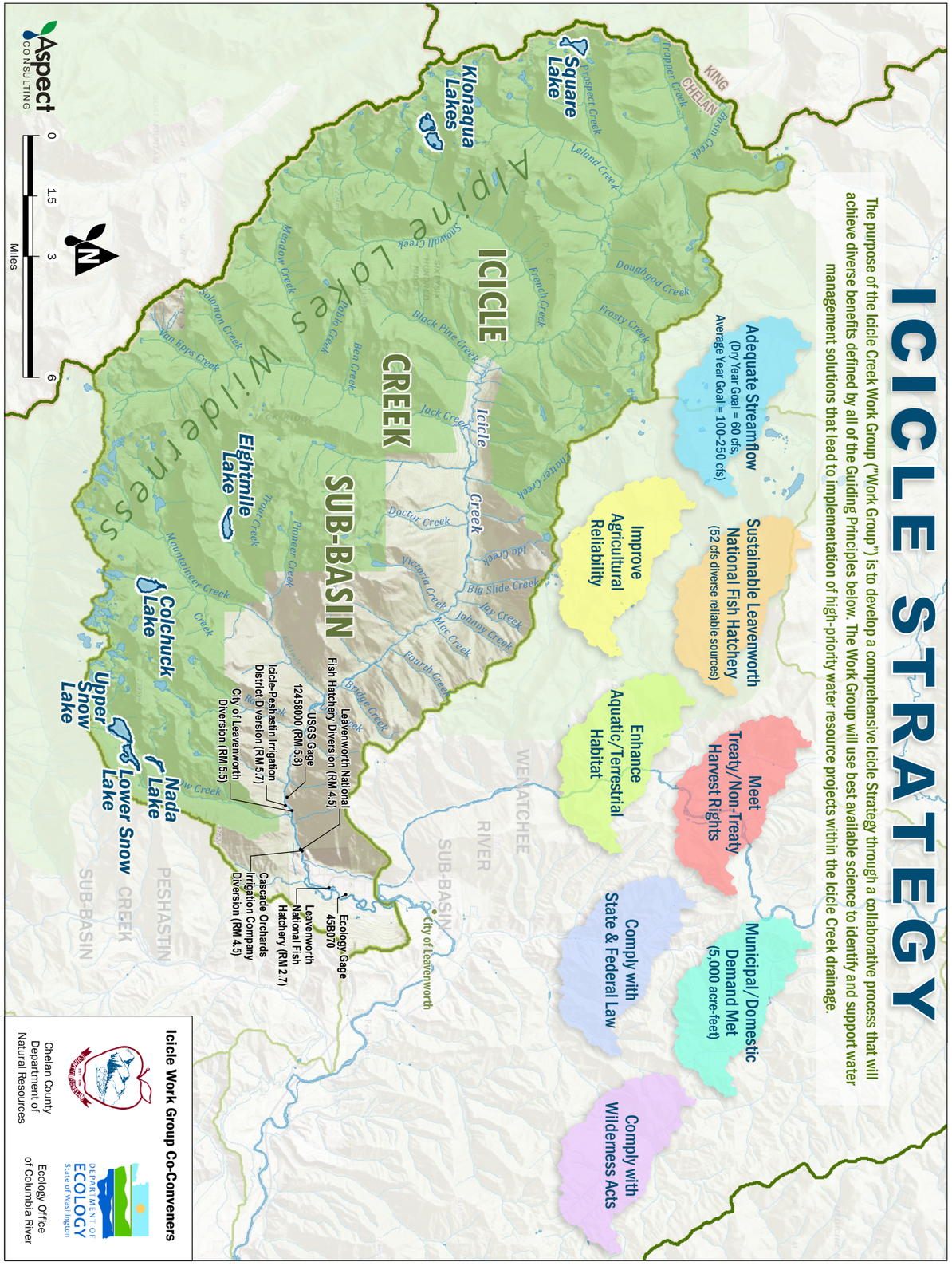
The Icicle Creek Water Resource Management Strategy will more than double instream flows for fish while also increasing water available for domestic and agricultural uses.

THE OFFICE OF COLUMBIA RIVER
Water for Families, Farms, and Fish

ICICLE STRATEGY

The purpose of the Icicle Creek Work Group ("Work Group") is to develop a comprehensive Icicle Strategy through a collaborative process that will achieve diverse benefits defined by all of the Guiding Principles below. The Work Group will use best available science to identify and support water management solutions that lead to implementation of high-priority water resource projects within the Icicle Creek drainage.

- **Adequate Streamflow** (Dry Year Goal = 60 cfs, Average Year Goal = 100-250 cfs)
- **Sustainable Leavenworth National Fish Hatchery** (52 cfs diverse reliable sources)
- **Improve Agricultural Reliability**
- **Meet Treaty/Non-Treaty Harvest Rights**
- **Municipal/Domestic Demand Met** (5,000 acre-feet)
- **Enhance Aquatic/Terrestrial Habitat**
- **Comply with State & Federal Law**
- **Comply with Wilderness Acts**



Icicle Work Group Co-Conveners

Chelan County Department of Natural Resources

DEPARTMENT OF ECOLOGY State of Washington

Ecology Office of Columbia River

Projects

BENEFICIARY

Alpine Lakes Reservoirs Optimization, Modernization, and Automation modernizes and automates the outlet and gate infrastructure at seven Alpine Lakes within the Icicle Creek Subbasin. The intent is to improve management and releases of stored water based on changing conditions to meet the Subbasin's needs. It increases streamflow for fish and improves reliability and operation of stored water for agricultural use and the Leavenworth National Fish Hatchery. **Early Action Items: 2019 - Snow Lake Valve Replacement; 2021-2022 - Alpine Lakes Automation*

Icicle-Peshastin Irrigation District (IPID) Irrigation Efficiencies explores options to improve irrigation delivery and on-farm efficiencies. Projects may include canal piping or lining and on-farm efficiency upgrades, which would improve drought resiliency and reliability to district users. This project also benefits fish by increasing streamflow. **Early Action Item: 2019-2021 - IPID Conservation Savings (7 cfs to date)*

Cascade Orchards Irrigation Company (COIC) Irrigation Efficiencies and Pump Exchange proposes to change COIC's point of diversion from its existing location at RM 4.5 on Icicle Creek to a location downstream near the Wenatchee River's confluence with Icicle Creek, and implement other water saving measures, such as piping the delivery system. This project improves irrigation water reliability and benefits fish by increasing streamflow.

Domestic Conservation Efficiencies focuses on conservation projects in the City of Leavenworth and Chelan County and implements municipal and rural water efficiency projects such as a lawn reduction program, leak detection and repair, meter installation, and water use conservation. This project would improve domestic supply.

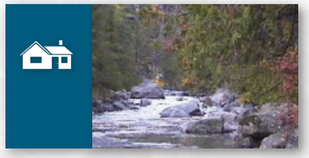
Eightmile Lake Storage Restoration rebuilds the Eightmile Lake dam to restore usable storage to the historical and permitted high water storage elevation. This would increase streamflow for fish, meet domestic water needs, and improve reliability and drought resiliency for agricultural users. Additional water for the City of Leavenworth would be preferentially pursued on the Wenatchee River to reduce impacts to Icicle Creek. **Early Action Item: 2020-2021 - Eightmile Restoration*

Tribal and Non-Tribal Fisheries ensures that projects and actions taken do not have negative effects on tribal fishery activity in the Icicle Creek Subbasin. It monitors fishery effectiveness and implements actions for improvement, while protecting Tribal Treaty and federally protected harvest rights and non-tribal harvest.

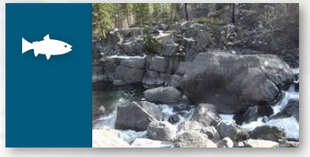
Leavenworth National Fish Hatchery (LNFH) Improvements focuses on projects to reduce surface water use and improve access to groundwater. These projects may include onsite reuse, an effluent pump back, and wellfield enhancements for year-round benefits. It would also increase streamflow for fish and improve access to reliable water for the hatchery's operations. These projects also improve water quality in Icicle Creek. **Early Action Item: 2020 - LNFH Reuse Pilot*

BENEFICIARY

Habitat Protection and Enhancement identifies and implements stream restoration and protection projects such as riparian plantings, engineered log jams, and conservation easements to improve stream habitat and ecosystem health.



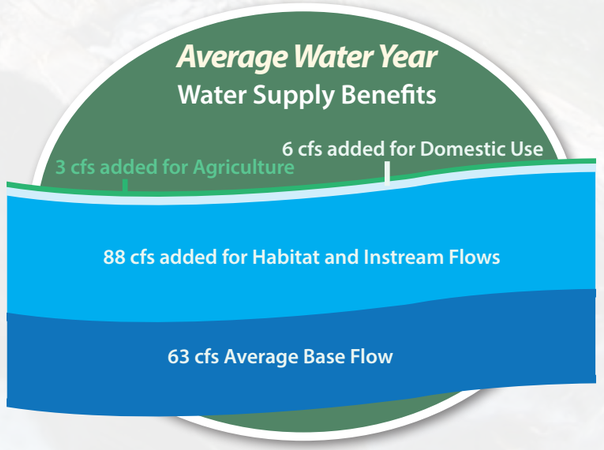
Instream Flow Rule Amendment modifies the instream flow rule's interim domestic reservation of 0.1 cfs to a final level of 0.5 cfs. This helps meet domestic water needs through 2050. As described in Chapter 173-545 WAC, the rule amendment requires instream flow and habitat restoration.

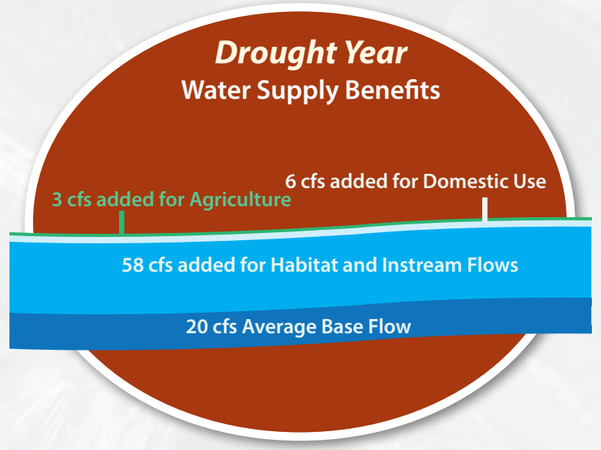


Fish Passage improves passage by assessing and removing barriers, so fish have better access to healthy habitats. This could include improved operation at Structure 2 and modification of channel morphology at the Boulder Field. Improved passage will increase the amount of habitat fish can access within the subbasin.
**Early Action Item: 2020-2021 - Boulder Field Passage*

Fish Screening upgrades fish screens on diversions to meet current standards. This will bring the major diverters on Icicle Creek into compliance with Washington State and federal screening requirements. These upgrades reduce fish mortality.
**Early Action Item: 2019-2020 - Fish Screening IPID and Leavenworth*

Water Markets creates an Icicle Water Market and seeds it with an initial 1,000 acre-feet of water for agriculture use in the Icicle Creek Subbasin and Wenatchee River Basins during shortages.





To ask about the availability of this document in a format for the visually impaired, call Office of Columbia River at 509-575-2490. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

AMI Boosts Meter-Reading Accuracy and Revenue

One of the easiest ways to increase revenue is to accurately bill customers for the water they use. To accomplish that goal, however, Enid, Okla., utility personnel knew they needed more than just new water meters.

BY SCOTT MORRIS

BEFORE CONSIDERING a meter upgrade to boost billing accuracy and revenue, the city of Enid, Okla., utility had three full-time meter readers, each of whom had to read an average of more than 330 meters per day. Taking into account vacation and sick time, unpredictable winter weather, and brutally hot summers, accomplishing 20,000 meter reads per month was an uphill battle. In addition, meter-reading activity is often hampered by unfriendly dogs, black widow spiders, and traffic dangers. There had to be a better way.

After researching the differences between mobile systems and fixed-base systems, utility personnel concluded that a fixed-base system was the best choice based on the city's topography, personnel and fuel costs, and the ability to read meters daily.

SYSTEM SETUP

When upgrading to a new system, good planning usually pays major dividends. For example, Enid's system uses a Federal Aviation Administration-licensed frequency to broadcast a signal from meters to 16 data collectors, which transmit the signal through a 4.9-GHz public safety channel back to the utility billing center. A Wi-Fi backhaul that serves as backup is also available to emergency personnel.

The utility added a few more units in the downtown area and the city's largest park to provide free public hot spots. In addition, as a loan requirement, the Oklahoma Water Resources Board required the city to have a 500-kW generator installed. The new generator was installed in the administration building, and the older, less powerful motors were repurposed.

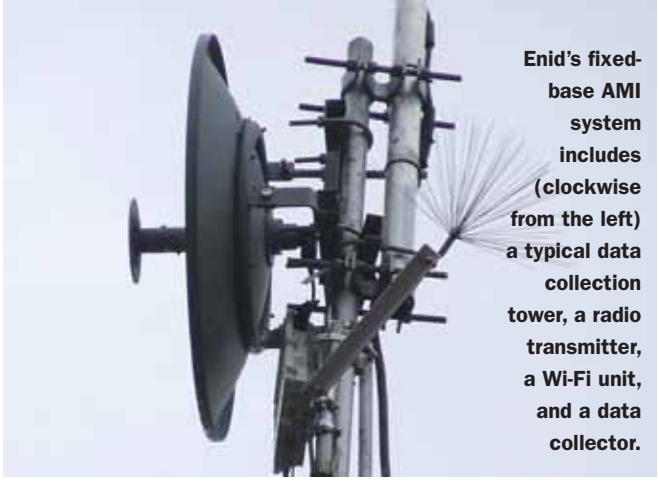
Enid's new AMI meters provide 720 times the amount of information previously available, capturing hourly readings.

SYSTEM BENEFITS

The updated system reads meters automatically without regard to weather, vacations, dogs, or even 15 in. of snow. In addition, the utility reduced the number of vehicles needed and gasoline consumed and eliminated using trucks for meter reads or, in some cases, for move-ins and tamper checks. For about 30 rural customers, the utility uses a hybrid system with drive-by registers and a handheld device.

Two of the utility's former meter readers were transitioned to other city positions, and the third meter reader became the utility's automatic metering infrastructure (AMI) technician. Staffing efficiency increased, and dangerous situations were eliminated.

2013 © American Water Works Association



Enid's fixed-base AMI system includes (clockwise from the left) a typical data collection tower, a radio transmitter, a Wi-Fi unit, and a data collector.

PHOTOGRAPHS: CITY OF ENID, OKLA.

The utility's customer service team now has the tools to provide unparalleled service. Automatic meter reading increased by 720 times the amount of information previously available. Instead of once-monthly readings, the system captures hourly readings.

The software is easy to use and provides detailed water-use information to customers. Utility personnel can ascertain when leaks started, when they were fixed, and at what rate they leaked. Residential customers are often surprised when they discover how much water they use to irrigate their lawns, and commercial customers can be made aware of their daily usage. This information better serves the entire community.

The utility has collected Global Positioning System (GPS) coordinates on all valves, meters, lines, hydrants, etc., so they can be accessed through a geographic information system. In a few months, the utility plans to use the GPS coordinates with other meter-read data to glean additional information. The utility also plans to release to customers software that will allow them to check their usage, view hourly consumption, and be alerted to leaks or other events.

http://dx.doi.org/10.5991/OPF.2013.39.0014

Scott Morris is Utility Services Department manager with the city of Enid (www.enid.org), Enid, Okla.

WATER LOSS = REVENUE LOSS

What do better meter-reading techniques have to do with managing water loss? During the upgrade, the city's contractor tested about 3,000 old water meters. The results were astonishing. The average low flow of tested meters was only 57 percent. Intermediate and high-flow tests were nearly 90 percent. Having new, more accurate meters in place will help customers become more aware of their usage and encourage them to fix leaks. Many old meters don't register a small toilet leak.

The utility also installed more accurate compound meters at many large apartments, schools, and businesses. Holding customers accountable for their consumption was the focus, but this isn't the only place to look for cost savings. Previously undetected distribution system leaks had resulted in millions of gallons in lost revenue.

The cost of installing a new system might seem overwhelming. Enid's system cost about $7.2 million, less a $2 million American Recovery and Reinvestment Act grant, for a net investment of about $5.2 million for 20,000 new meters. Because the new meters and other efficiencies are making up for revenue previously lost because of old, inaccurate meters, the utility is making big strides toward paying for the system. For large industrial water users, accuracy is even more important. The monthly bill of one 5-mgd water user has increased more than $130,000 per month.

THE EFFORT CONTINUES

Considering water availability and infrastructure replacement costs, utilities must make water loss a priority. The city of Enid began its conservation efforts by replacing and upgrading its meters and billing system. The effort continues by replacing older large water mains and by researching and developing ways to reuse treated water from reclamation facilities. Investments in this area could significantly reduce demand for potable water.

2013 © American Water Works Association

ICICLE STRATEGY

Conservation

PROJECT DESCRIPTION

In 2014, the Icicle Work Group convened a water conservation subcommittee to coordinate water conservation projects that would benefit Icicle Creek streamflow and domestic supply across multiple local jurisdictions. Current members of the subcommittee include agricultural, municipal, and environmental interests: Icicle Peshastin Irrigation District (IPID), Cascade Orchards Irrigation District (COIC), City of Leavenworth (City), Icicle Watershed Council (ICSC), Chelan County, WA Dept of Ecology, and Washington Water Trust (WWT). The focus of the group is to implement common sense water conservation measures for agricultural, municipal, and rural domestic water uses. The subcommittee is working on understanding what conservation has been achieved through past work, how water use now compares to other regional water use, and what can be done to improve conservation in the Icicle Creek Subbasin.

PAST CONSERVATION EFFORTS

AGRICULTURE

More than $1.3 million spent by IPID in last 10 years.

Past conservation efforts:

- 15.4 miles of canals piped
- Canal lining
- On-farm efficiency upgrades

DOMESTIC & MUNICIPAL

3.6 million spent in last 20 years

56 million gallons of water savings

Past Leavenworth residential use: 389 gpd

Past conservation programs:

- Leak Detection Program
- Landowner Technical Assistance
- Meter Installation

WATER USE

AGRICULTURE

Current Use:

IPID: 3.9 ft/acre water duty

COIC: 6.0 ft/acre water duty

Average Water Duty: 4 ft/acre

Conservation Goals:

IPID goal: 3.51 ft/acre water duty

COIC goal: 5.70 ft/acre water duty

DOMESTIC & MUNICIPAL

Current Use:

Leavenworth average residential use of 269 gpd

Regional average residential use of 340 gpd/ERU

Conservation Goals:

Conserve an additional 130 MG of water

NEXT STEPS

AGRICULTURE

- Pipe entire COIC
- Lining additional 2,000 ft of IPID canal in 2019
- Prioritizing conservation projects identified in IPID Conservation Plan and review funding options
- Evaluate Voluntary Lawn Reduction Incentive Program

DOMESTIC & MUNICIPAL

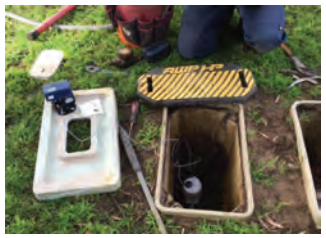
City

- Improve 30 miles of pipe to reduce leaking
- Upgrading 830 residential meters
- Implementing a Conservation Program to encourage water efficient fixtures
- Evaluate Voluntary Lawn Reduction Incentive Program

County

- Evaluate Voluntary Lawn Reduction Incentive Program

LINER REPLACEMENT



METERS

PIPING

LAWN REDUCTION

e

SUB-BASIN

Pioneer Creek

Eightmile Creek

Rat Creek

Eightmile Lake

Mountaineer Creek

Snow Creek

Epps Creek

Colchuck Lake

Nada Lake

Lower Snow Lake

Upper Snow Lake

PESHASTIN CREEK SUB-BASIN

MISSION CREEK SUB-BASIN

Peshastin

Dryden

Leavenworth

Domestic Rural Housing in Chelan County

Private Land Ownership

IrrigationDistricts

Leavenworth Urban Growth Area

COIC Service Area

N

0 1.5 3 6

Miles

Aspect CONSULTING

GIS Path: S:\Projects\Meghan\GIS data\Icicle\Conservation.mxd | | Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet | | Date Saved: 6/11/2019 | | User: mdriver | | Print Date: 6/11/2019